Representation of British society in paintings of the British Industrial Revolution.

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Abstract

This thesis examines how the Industrial Revolution was perceived and presented in British art of the Industrial Revolution. This is done by analysing selected paintings of the Industrial Revolution by painters who are considered to be among the most influential figures in British art, these being Joseph Wright of Derby, J.M.W. Turner and Ford Madox Brown. The three painters in question represent different stages of the Industrial Revolution, with Wright of Derby presenting its infancy, Turner presenting its peak and Madox Brown presenting its after-effects. The analysis of their works is supplemented with historical perspectives of the Industrial Revolution by both historians and polemic writers and artists. The paintings chosen for analysis are selected according to their relevance to the Industrial Revolution, with their cultural significance being considered as well. The study is focused on social developments over the course of the Industrial Revolution, and so the ways in which the Industrial Revolution changed and shaped British society are key elements in the analysis. The historical perspectives maintain that while the Industrial Revolution brought advancements in industry and transportation, it also led to working people living destitute lives, and it also caused immense pollution in urban areas, thus causing an increase in death rate in Britain. The polemic views claim that the Industrial Revolution caused the decline of the British countryside and led to the negligence of natural beauty to facilitate the increase of factories. The people who worked in factories had very limited options in their life, as their managers largely had complete control over them, and could thus abuse their workforce to optimise production.

The analysis found that the advancements of the Industrial Revolution were initially viewed with optimistic inquisitiveness along with feelings of wariness owing to the uncertainties regarding the advancements which were yet to come. Later on, the advancements became a regular part of life so that even wary observers adapted to them and altered their ways of thinking. Eventually the advancements led to the differences between social classes increasing, causing unemployment and general hardship among the working class. Industrialisation ultimately shaped British society so that it changed irrevocably, and common people ended up in a predicament where they had to adapt to the changes in the world they knew, regardless of how they felt about the changes in question.

Tiivistelmä

Tämän tutkielman tarkoituksena on selvittää, miten teollinen vallankumous ilmeni vallankumouksenaikaisessa brittiläisessä kuvataiteessa ja millä tavoin siihen suhtauduttiin. Tutkielmassa analysoidaan valittuja maalauksia, joiden tekijöitä pidetään Brittiläisen taiteen tärkeimpinä edustajina. Kyseiset taiteilijat, Joseph Wright of Derby, J.M.W. Turner sekä Ford Madox Brown, edustavat teollisen vallankumouksen eri vaiheita. Wright of Derby edustaa vallankumouksen alkuvaiheita, Turner sen huippua ja Madox Brown sen jälkivaikutuksia. Historioitsijoiden sekä vallankumouksenaikaisten kirjailijoiden ja taiteilijoiden näkemykset tukevat maalausten analysointia. Tutkimusaineistona olevat maalaukset on valittu niiden kulttuurisen arvon sekä sen perusteella, miten paljon ne ovat yhteydessä teolliseen vallankumoukseen. Tutkielma keskittyy yhteiskunnassa tapahtuneisiin muutoksiin teollisen vallankumouksen aikana, joten teollisen vallankumouksen vaikutukset brittiläiseen yhteiskuntaan ovat tärkeässä osassa tässä tutkielmassa. Historiallisten näkökulmien mukaan teollinen vallankumous johti teollisuuden ja kulkuneuvojen kehitykseen, mutta aiheutti myös köyhyyttä ja kaupunkialueiden saastumista, mitkä puolestaan johtivat kuolleisuusasteen nousuun Britanniassa. Kirjailijoiden ja taiteilijoiden mielestä teollinen vallankumous aiheutti brittiläisen maaseudun alasajon ja johti teollisuuden leviämisen kautta yleiseen välinpitämättömyyteen luonnon suhteen. Tehtaissa työskentelevillä ihmisillä oli erittäin vähän valinnanvapauksia, sillä työnjohtajilla oli heihin suhteessa täysi ylivalta, ja he saattoivat väärinkäyttää valtaansa tuoton maksimoimiseksi.

Analyysin kautta selvisi, että teollisen vallankumouksen tuomiin muutoksiin suhtauduttiin aluksi optimistisen uteliaasti ja toisaalta tulevaisuuden epävarmuuksien vuoksi varovaisesti. Myöhemmin näistä muutoksista tuli tavallinen osa elämää, ja näin varovaisemmatkin ihmiset sopeutuivat niihin ja muokkasivat omia ajatusmaailmojaan. Nämä muutokset lopulta johtivat luokkaerojen kasvamiseen, mikä puolestaan johti varsinkin työnväenluokan työttömyyteen. Teollistuminen muutti brittiläistä yhteiskuntaa pysyvästi, ja tavallinen kansa joutui tilanteeseen, jossa heidän täytyi sopeutua siihen, että heidän tuntemansa maailma muuttui riippumatta siitä, miten he itse suhtautuivat näihin muutoksiin.

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1 Introduction

The Industrial Revolution, considered to have taken place in Britain from the 1750s to the end of the 19th century, is often seen as a revolution of tools, machinery and systems of production, as well as being considered one of the most important eras in modern history. However, its impact on society at large—families, communities and mechanisms of labour, for example—is not always discussed when its importance and its influence are debated. Mantoux (1961) writes that while the use of machinery is an insufficient definition for the Industrial Revolution, it does nevertheless remain the leading fact associated with it (p. 189). Social upheaval usually finds its way into the arts, which can be seen in the works of such socially critical artists and writers as Émile Zola, Charles Dickens and William Hogarth, for example. It would therefore be useful to study such historical views in order to understand how the impact of the Industrial Revolution on society was perceived at the time. This thesis focuses on how changes in society are reflected in paintings of the Industrial Revolution, and how society and the Industrial Revolution relate to each other in these paintings. Therefore, while much of the discussion regarding the Industrial Revolution is centred around the contrasting pair of rural-urban, this thesis is concentrated on people, not places. The paintings analysed are selected according to their relevance to the subject and their cultural significance. The main themes in this thesis are society and industrialisation in accordance with the Industrial Revolution, and these main themes are integral in deciding which paintings are placed under analysis. The paintings in question will be analysed descriptively from the point of view of the research questions. The main question in this thesis is: How do British paintings of the late 18th and of the 19th century reflect the effects the Industrial Revolution had on society? This does not merely refer to changes in industrial mechanisms and working life, but also the effects the Industrial Revolution had on everyday life of common people. Another question presented herein is: How do the common people in the paintings perceive and react to the Industrial Revolution, and what effects the Industrial Revolution had on common people of the era can be inferred from these reactions?

The works of three painters of slightly different eras are analysed for the purposes of this thesis: Joseph Wright of Derby (1734–1797), Joseph Mallord William Turner (1775–1851) and Ford Madox Brown (1821–1893). Eight paintings are under analysis, these being Wright of Derby's *The Philosopher's Lecture on the Orrery in which a Lamp is Put on the Place of the Sun* (1766), *Experiment on a Bird in the Air Pump* (1768), *The Blacksmith's Shop* (1771), *An Iron Forge* (1772) and *The Alchymist* (1795), Turner's *Fighting Temeraire* (1839) and *Rain, Steam and Speed* (1844) and Madox Brown's *Work* (1865). There are therefore five paintings by Wright of Derby, two by

Turner and just one by Madox Brown. This is due to Wright of Derby having painted several paintings that were in some way related to advancements of technology, and in particular portrayed the reactions of people towards these advancements. Madox Brown's sole work under analysis, on the other hand, focuses on society, not machines, and therefore, while it does explain how the Industrial Revolution shaped roles in British society, the concept of industrialisation itself is far more present in the works of Wright of Derby, and to a lesser extent Turner, resulting in the works of Turner and Wright being more practical in the analysis of the effects of industrialisation and thus more practical within the scope of this thesis. It should also be noted that while the thesis is focused on the effects the Industrial Revolution had on people, there are no direct representations of people in Turner's paintings, and so the analysis of his works is more dependent on the effects the industrial elements of his paintings can be purported to have had on society than Madox Brown and Wright of Derby's works, which directly portray reactions of people towards elements of the Industrial Revolution.

This thesis is divided into five main sections, these being Method, Background, Materials, Analysis and Discussion, in that order. The Method section explains how the study is conducted and how the different elements pertaining to the research are taken into account and how they correlate with each other in the thesis. The use of images of paintings in relation with copyright matters is also discussed in that section. The Background section is divided into three parts, starting with The Concept of the Industrial Revolution and then followed by Perspectives of the Industrial Revolution and The Worker of the Industrial Revolution. The first of these sub sections, The Concept of the Industrial Revolution, mainly contains existing views of historians as regards the meaning of the concept of Industrial Revolution along with views on the development of the term itself. In the second sub section, Perspectives of the Industrial Revolution, existing polemic views regarding society and mechanisation over the course of the Industrial Revolution are discussed. In the third sub section, additional perspectives regarding the status of the worker of the Industrial Revolution are discussed, supplemented with accounts of the realities of life of factory workers and other members of society whose ways of life were largely structured by the effects of the Industrial Revolution. This third sub section of the Background section differs from the second sub section insomuch that it is based less on the discussion of polemic views and more on the accounts of historians. In the third main section, Materials, the painters whose works are the nucleus of this thesis are described and discussed, with that section acting as a brief biography of the painters and those of their attributes which set them apart from their contemporaries. That section is followed by Analysis, where the paintings themselves are analysed and discussed, supplemented with photographic images of the paintings. Each painting is analysed separately, with some of the paintings compared to each other where applicable. The final

section, Discussion, sees the results of the analysis discussed with the views on the Industrial Revolution presented in the Background section as the basis of discussion and the results applied to the consideration of the research questions.

2 Method

This study is structured around aspects of the Industrial Revolution and British society during the Industrial Revolution, and how these two are presented in British paintings of that era. For the purposes of this study, each of these three elements—the Industrial Revolution, society during the Industrial Revolution and British paintings—needs to be given sufficient attention. This study is hence not simply a study of individual paintings, but also a study of social history and of how paintings and social history interrelate. Thus, due appreciation needs to be given in the methodology of the study. This is why there are in principle two sides to this study: on one hand, there is the study of society and the Industrial Revolution, which essentially functions as background data. On the other hand, there is the study and analysis of relevant paintings of the same period, and this is the main objective of the thesis and the element around which the thesis is based, and therefore dependent on and supported by the background data. At the same time, the paintings are distinct from historical perspectives, as the paintings concentrate on specific scenes in British life in the 18th and 19th centuries, whereas the perspectives of historians are modelled to be more general and provide a more complete picture of society as a whole. Therefore, drawing direct comparisons between the artistic works and the literary background is not useful. Instead, the role of background data is to help shape the analysis of the paintings.

The paintings chosen for analysis in this thesis are chosen selectively, with their relevance and cultural significance as the main criteria. Paintings which chronologically are not seen as belonging within the scope of the Industrial Revolution are not included. To maintain clarity, paintings are chosen from the second half of the 18th century and the whole of the 19th century, as mentioned in the introduction. Additionally, as society is the key element under consideration in this analysis, genre paintings are favoured in the selecting process of appropriate works due to their nature of depicting scenes where social activities take place. Industrial elements in the paintings are also important in the selection process. The goal of the thesis is not to start comparing paintings and their levels of industrial relevance or functions of society, but to analyse the role that these elements have in the paintings, thus generating a perspective which might shed light on industrial society. This also means that the significance and meaning of each painting is analysed separately so that each painting will provide its own perspective on the nature of the Industrial Revolution, without needing to depend on collective cohesion. Nevertheless, relevant comparisons between paintings are discussed so that they might provide further insight for the purpose of analysis. As is typically the case with studying paintings, the analysis is largely dependent on subjective perception. However, objective descriptions

of the contents of the paintings are used as the basis of correlating the research material with historical studies of the Industrial Revolution whenever possible in order to restrict the level of bias.

Photographic images of paintings are used in this thesis to support discussion of the Industrial Revolution and its presentation in art, and especially in the analysis of the paintings in section 5 of this dissertation. These images are used in accordance with the Copyright, Designs and Patents Act 1988 and Creative Commons licences, with the particular licence used depending on the artwork in question. According to the Copyright, Designs and Patents Act of 1988, "Fair dealing with a literary, dramatic, musical or artistic work for the purposes of research or private study does not infringe any copyright in the work or, in the case of a published edition, in the typographical agreement" (p. 13). Works under the Creative Commons Attribution-NonCommercial-ShareAlike licence (CC BY-NC-SA) can be freely copied, redistributed and adapted under the conditions that appropriate credit is given, the licence is linked to and possible changes to the original are pointed out. Additionally, the material may not be used for commercial purposes and should there be any transformations to the work, then the new contributions must be distributed under the same licence as the original (Attribution-NonCommercial-ShareAlike 4.0 International). The Creative Commons Attribution-NonCommercial-NoDerivatives licence (CC-BY-NC-ND) is identical to the former with the exception that it forbids distribution if there are alterations to the original (Attribution-NonCommercial-NoDerivatives 4.0 International). In this dissertation, images of the paintings are mostly reproduced without changes from the original sources. The only changes made are that some images under the CC BY-NC-SA licence are resized to accommodate the structure of the page in the dissertation. In these cases, the changes are marked under the image. The images are used merely for the scholarly purposes of this dissertation and their use is therefore strictly non-commercial. Credit is given to the original sources under each individual image and full references for the paintings, including specification of their locations, are included in the References section at the end of the thesis.

3 Background

This section concerns the historical background of British society around the time of the Industrial Revolution, in particular as it pertains to changes in the lives of common people. This includes briefly analysing and discussing polemic works, in particular poetry, critiquing the Industrial Revolution, including poems by Anna Seward and Oliver Goldsmith. These polemic perspectives are from either the 18th century or the first half of the 19th century, and thus coincide with the process of industrialisation and the general development within the context of the Industrial Revolution. The section is divided into three parts, with section 3.1 concerning perspectives on the use and validity of the term 'Industrial Revolution', followed by section 3.2 focusing on general attitudes towards the Industrial Revolution itself as it progressed. Finally, section 3.3 focuses on the status of workers during the Industrial Revolution and attempts to construct a comprehensive view of the life of working people during the Industrial Revolution. Together, these sections serve to construct a complete perspective on the nature of the Industrial Revolution in order to facilitate drawing parallels to it in the analysis. In some parts of this thesis, a difference is made between the capitalised form of 'The Industrial Revolution', meaning the era of change from the 1750 through to the end of the 19th century, and the lower-case 'industrial revolution', which pertains to the general idea of one or more industrial revolutions taking place outside the process of industrialisation in the 18th and 19th centuries, and effectively acts as a theoretical and hypothetical view on the possibility of the process of industrial revolution outside the Industrial Revolution that is the main subject of this thesis. This enables a discussion of the concept of industrial change beyond the realm of existing history.

3.1 Concept of the Industrial Revolution—History and application of the term

The term 'Industrial Revolution' has long been subject to debate, as it is often not seen as a 'revolution' *per se* in the same way as the Russian Revolution of 1917 and the French Revolution of 1789 typically are, that is, a sudden and dramatic wave of upheaval in a society, resulting in drastic and permanent changes. Additionally, these other revolutions mentioned here are remembered for the violence that accompanied social upheaval, something which did not take place in the same way in the Industrial Revolution and was not as concentrated. The violence which did take place in the form of the Luddite Riots, for example, was targeted at the machinery used in factories rather than people, as described in section 3.3 of this thesis. Mathias (1969) considered the use of the term 'revolution' overdramatic due to the idea of a substantial change happening in a short space of time the term conveys, although he does concur that the era did bring pivotal changes (pp. 3–4). Conversely, Cipolla found that there was no revolution in history that was "as dramatically revolutionary as the Industrial

Revolution – except, perhaps, the Neolithic Revolution" (Zmolek, 2013, p. 36). Reid (1992) suggests that the reason for the Industrial Revolution not being remembered as a catalyst of violence in the way of the French and Russian Revolutions was that the changes in social relations were not radical, but rather a progression from past social relations (p. 31). However, it has to be noted that the effects of industrialisation on people living and working in British society go far beyond simple progression as outlined in section 3.3 of this thesis, and its consequences, certainly as regards applications of inventions and mechanisms of labour, have been widespread and continued to progress through the 20th and into the 21st century. While the Industrial Revolution was perhaps not as sudden as other notable revolutions, its consequences can be said to be far more substantial. Over the course of the late eighteenth and especially the nineteenth century, the Industrial Revolution meant an upheaval in society, as production was largely urbanised which meant that population would also have to move to cities, leading to less work taking place in the countryside. For example, the population of Manchester in 1773 was in the region of 30,000 but increased to 50,000 by 1790 and then to 95,000 by 1801 (Zmolek, 2013, p. 33), thus increasing by more than threefold in just over a quarter of a century. Zmolek (2013) writes that it was in fact all the towns in this region that experienced such a dynamic growth in populace, mostly owing to the influx of workers to the rapidly built cotton mills and later, in the Leeds area, to woollen mills (p. 33). This process of mass relocation of populace, along with the master-worker relationship of industrial factories, would assert that changes in social conditions were in fact profound, as the communal aspects of society elided in the face of the ascent of an industrial society where workers would toil in factories, supervised by their employers, and the employers could exercise complete control over their workers, causing labourers to act as faceless servants rather than as individuals. Generally speaking, factory hands were relieved of choices and options in their work. Whether such a change would qualify as a progression is up to debate. Heaton (1967) specifies the term 'Industrial Revolution' as an umbrella term for "economic and technological developments which gathering strength and speed during the eighteenth century produced modern industrialism" (p. 31), signifying the nature of the Industrial Revolution as a progression, not a sudden change. This is supported by More (2000) stating that for some historians, it was a continuation of earlier change, whereas for others, the degree of change in economic growth was such that it can be considered revolutionary (p. 11). It can therefore be concluded that whether the Industrial Revolution should actually be referred to as a revolution remains debatable, although the standardisation of the term itself would suggest that it is in fact considered a revolution in line with other key revolutions in modern history. Attempts to standardise the meaning of 'revolution' and then debating whether the Industrial Revolution fits the standardised criteria of the term would seem needlessly pedantic when considering the fact that Industrial Revolution was the catalyst of modern industrialism and its effects

have continued to resonate through the modern age of globalisation and will likely continue to do so. Additionally, when it comes to revolutions in the modern era, the Industrial Revolution likely has a more widespread and a more permanent effect than any other revolution.

Another matter of discussion is the timing of the Industrial Revolution, speculatively set as taking place from 1750 to 1900 in this thesis. Zmolek (2013) states that "if there is anything about which there appears to be a general consensus within the literature, it is that there was no specific moment when the epochal event known as the Industrial Revolution occurred" (p. 36), which would suggest that much like the debate of whether the Industrial Revolution is a revolution or not, its timing depends on the perspective which is adopted in discussing the question. Mathias (1969) argues that the beginning of the Industrial Revolution can be timed by observing the beginning of rapid, cumulative, structural change, and thus the beginning of the process can be set between the 1740s and the 1780s (p. 3). Toynbee considers the year 1760 to be the watershed of the Industrial Revolution, stating that the state of the English economy was comparatively backwards at that time when bearing in mind what was to come, with none of the mechanical inventions having been introduced and the agrarian changes still in the future (Zmolek, 2013, p. 75). Additionally, he writes that the existing system was already decaying in 1760, but "had not yet been superseded by the modern principle of industrial freedom" (Zmolek, 2013, p. 75). Selecting a starting point from the 18th century has therefore been debatable, and some historians have felt that "the absolute impact of industrialisation only became widespread during the nineteenth century" (More, 2000, p. 11), which would further complicate the process of assigning a definitive beginning for the Industrial Revolution. As for the end of the Industrial Revolution, More (2000) argues that it should be timed at either 1830 or 1850, depending on whether the emergence or the widespread adoption of railways is considered to be the end point (p. 11). However, electing such an element of change as a defining point of conclusion for the era of the Industrial Revolution would likely incite more debate due to disagreements over the selection of the introduction of one element of change as a point of conclusion over another. Instead, it can be argued that while the changes most typically associated with the Industrial Revolution, the application of railways in particular, had found their conclusion in the mid-1800s, the driving force of technological development indicative of the Industrial Revolution continued and the scope of industrialisation broadened. It might be argued that the cycle of industrial invention ultimately led to the construction of war machines during the First World War, which would extend the era of the Industrial Revolution well into the 20th century. Whether the use of war machines is seen as a direct result of the Industrial Revolution and thus potentially its actual conclusion, or a mere after-effect and thus distinct from the concept of the Industrial Revolution itself, remains open

to discussion. It might even be argued that the Industrial Revolution should be assigned no point of conclusion at all, as effectively the technological developments of the 20th and 21st centuries are a direct continuation of the Industrial Revolution and would not have been possible without it. This effectively requires delimiting the term Industrial Revolution to define what developments are included within the term and what are not, and thus assigning a specific albeit potentially malleable timeframe for it. If we were to adopt Heaton's description of the Industrial Revolution as the economic and technological developments which produced modern industrialism, then we can consider the Industrial Revolution to be the catalyst for later developments, and thus separate it from advancements which only came about after the system of modern industrialism had developed. With this in mind, restricting the conclusion of the Industrial Revolution to the 19th century would be advisable, as the key changes in commerce and mechanisms of labour took place and were normalised during that century.

Regarding the use of the term Industrial Revolution, Hawke (1993) elaborates that the term was first used in the 1830s by a French economist, Blanqui, to draw parallels between the developments in Britain and some of the political advancements taking place in France at the time, and it was not until Arnold Toynbee's lectures in the early 1880s that the term 'Industrial Revolution' was cemented (p. 54). Regarding the Industrial Revolution, Blanqui states that it started in England, and it resulted in some key changes in commerce. For example, he states that in the late 18th century, all cotton used in Europe was imported from India, but only twenty-five years later, England was a key exporter of cotton (Blanqui, 1837, p. 209). As for the general use of the term 'revolution' in France in conjunction with the era, Bezanson (1922) mentions that scientific articles published as early as 1827 used the term 'Grande Révolution Industrielle', The Great Industrial Revolution, in describing developments in arts, manufactures and social institutions (pp. 343–344). Another example of the use of the term in the same era is in 1829 by Prosper de Launay, whose speech was preceded by a discussion on the state of industry, in particular the decline of linen industry in face of the rise of cotton and beetroot industry; Launay would state that while the produce of his department had been substantial twenty years earlier, there was none left (Bezanson, 1922, p. 344). In 1844, the French historian Guilbert used the term more broadly, referring to 'industrial revolutions' of the 17th century, referring to changes in commerce of that era, and the term has also been applied to the 16th century (Bezanson, 1922, pp. 344–345), thus applying the term far beyond the scope for which it is typically reserved. Guilbert also used the term 'revolution' when referring to changes outside of commerce, namely discussing religious, political and industrial revolutions (Bezanson, 1922, p. 345). As for the timing of the Industrial Revolution in France compared to England, Picard writes that an industrial revolution

was already taking place in England by the time the French Revolution of 1789–1799 was over, and the Industrial Revolution happened in France between 1815 and 1830 (Bezanson, 1922, p. 345), thus confirming that the Industrial Revolution took place in England well before it did in France. Another, earlier, example of the word 'revolution' being used in relation with changes in industry is in the writings of Chaptal in 1806, where he refers to a revolution in industry as a transition phase (Bezanson, 1922, p. 346). The relation in terminology between the French Revolution and the Industrial Revolution has also been specifically noted in several cases; for example, Lamartine called it the 1789 of industry (Bezanson, 1922, p. 347). In essence, the spreading of the term 'Industrial Revolution' was largely fragmented and unsystematic, whereby the term was not applied to a specific location or a set of changes, but was rather a general term applied to the ongoing changes in the industrialising society, but without a clear indicator regarding what was concerned as belonging to the Industrial Revolution and what was not.

Heaton argues that when the term 'Industrial Revolution' is objected to, the main issue is in the word 'revolution', but at the same time, he concurs with Hawke's statement in saying that the use of the term goes back to the time of the Industrial Revolution itself, as the introduction and application of new machinery was much revered (Heaton, 1967, p. 31). At the same time, this era also brought overproduction and depressions along with economic difficulties for the factory worker despite increases in finances for the landlords and manufacturers (Heaton, 1967, pp. 32–33). What the Industrial Revolution does entail, however, is a series of changes in industrial life as well as in economy and society. Ashton (1968) mentions some of these in stating that labour became more specialised, some new skills were developed, with others lost at the same time, new sources of raw material were exploited and the State adopted a less active role in dictating how businesses should be run, with individuals and innovations changing the structure of society for times to come (pp. 1–2). Deane (1969), in turn, considers an industrial revolution to be simply an element in the cycle of eras in a society, and describes it as "[a] continuous—some would say 'self-sustaining—process of economic growth, whereby (wars and natural disasters apart) each generation can confidently expect to enjoy higher levels of production and consumption than its predecessors, is open only to those nations which industrialize" (p. 1). Toynbee writes that "the essence of the Industrial Revolution is the substitution of *competition* for the mediaeval regulations which had previously controlled the production and distribution of wealth" (Zmolek, 2013, p. 75). Therefore, the concept of the Industrial Revolution would not be based on industrialisation itself, but on a change of system in commerce. Nef argued against Toynbee's view, stating that "the concept of an Industrial Revolution would seem to be especially inappropriate as an explanation of the triumph of industrial civilization in Britain",

due to it suggesting that the process of change "was especially sudden, when it was in all probability more continuous than in any other country" (Zmolek, 2013, p. 75).

Deane (1969) also describes the rift between advanced and underdeveloped countries to be a result of some countries having gone through the process of industrialisation, whereas others have not (p. 1). This process of industrialisation would not be the same for all countries in which it occurs, but would nevertheless include some "identifiable changes in the methods and characteristics of economic organization which, taken together, constitute a development of the kind which we would describe as an industrial revolution" (Deane, 1969, p. 1). Deane specifies the changes in question to be as follows:

1) "Widespread and systematic application of modern science and empirical knowledge to the process of production for the market
2) Specialization of economic activity directed towards production for national and international markets rather than for family or parochial use
3) Movement of population from rural to urban communities
4) Enlargement and depersonalization of the typical unit of production so that it comes to be based less on the family or the tribe and more on the corporate or public enterprise
5) Movement of labour from activities concerned with the production of primary products to the production of manufactured goods and services
6) Intensive and extensive use of capital resources as a substitute for and complement to human effort
7) Emergence of new social and occupational classes determined by ownership of or relationship to the means of production other than land, namely capital."

(Deane, 1969, p. 1)

These interrelated changes would, provided that they develop together sufficiently, constitute an industrial revolution (Deane, 1969, p. 2). Together, these conditions function as rules of change, as they might be interpreted and identified as in this context. These rules of change are effectively the conditions which have to be met in order to constitute an industrial revolution. On discussing the Industrial Revolution, it can be asserted that each of these conditions were met, and some—in particular, conditions 1) – 4)—are directly representative of it. Application of modern science and movement of the populace are conditions which are perhaps most linked with the Industrial Revolution in the study of history, which is prevalent in the data used in this dissertation. Of these four, condition 3), movement of the population from rural to urban communities, stands out as it is not directly related to production. The movement of populace does, however, also facilitate the realisation of the other conditions, and in particular to maintain an Industrial Revolution as an urban, factory-driven process of change. In condition 5), the change in production from primary products to manufactured goods and services is considered a key element in industrial change. In this context, the term 'primary products' refers to such raw materials as agricultural products and mining produce.

Manufactured goods and services would therefore refer to the end product of raw materials, thus meaning the final produce as opposed to its components. Therefore, in an industrial setting, the production of these raw materials changes in objective to accommodate what is perceived as the final produce. This should in turn have direct consequences for the nature of agriculture, as a crop of produce becomes just one component of the final produce. Similarly, work done in colliers may focus on harnessing specific produce, but the produce in question would ultimately only be a particle in the broader cycle of production, which would therefore also decrease the perceived significance of each field which produces an element which eventually only constitutes part of the final produce. Condition 6), the intensive and extensive use of capital resources to complement and substitute for human effort, is reliant on the systematic centralisation of labour, which is partly what the factory system is based on. Additionally, it requires an initiative on the part of managers to increase and streamline production through careful expenditure. The expenditure in question would be required to be of systematic nature: for example, every time production seems to be hindered by shortage of employees or factory machines being below standards required for further progress, these problems could be addressed to optimise production, a cycle which would be repeated whenever production is deemed to be below a required standard. The final rule of change, condition 7), prescribes the emergence of new social and occupational classes determined by their ownership and control of the means of production. The emergence of the system of masters overlooking masses of workers as opposed to the approach used in agriculture prior to the Industrial Revolution confirms this rise of a new division of classes in labour.

3.2 Perspectives on the Industrial Revolution—from lush pastures to smouldering fires

In discussing the Industrial Revolution, there has often been a contrast of two prevailing approaches in place: on one side, emphasis is on the advancements in technology and, to a lesser degree, advancements in the social status of workers, and on the other side, there is the criticism of poor working conditions and degradation of the economic and sanitary well-being of both factory workers and other people. This duality demonstrates the importance of perspectives in considering the effects of the Industrial Revolution, as there is an element of choice involved in historical analysis, as the approach adopted by the analyst will affect the results of his study. Historical analysis is also dependent on existing studies and sometimes guided by past polemic views. Therefore, it would be useful in the study of history to also consider views which were presented by polemicists of the epoch in question, and which thus have not been affected by hindsight. At the same time, it is important to remember that these views differ from views of historians, as these views have a more limited

perspective on historical developments. Stevenson (1993) brings up two outspoken critics of the changes in British society that were caused by the Industrial Revolution, Charles Dickens and William Cobbett, whose criticisms have focused on the "loss of a rural world of security and prosperity" and "the squalor and degradation of the new mass society of the factory towns", respectively (p. 230). These two views focus on different aspects, these being rural and urban surroundings, but nevertheless concern similar issues, as they focus on the decline of each type of area as the direct result of the Industrial Revolution and the changes it has caused in the lives and the realities of common people. This is not to say that these changes would have been after-effects, but it should instead be mentioned that this is a matter of consequences taking place as the Industrial Revolution progressed, i.e. it is a case of progressive developments. Stevenson states that the modern conception of the social repercussions of industrialisation is largely in balance with Dickens' description of Coketown in *Hard Times*. In the paragraph in question, the appearance of Coketown is described as follows:

> It was a town of red brick, or of brick that would have been red if the smoke and ashes had allowed it; but as matters stood it was a town of unnatural red and black like the painted face of a savage. It was a town of machinery and tall chimneys, out of which interminable serpents of smoke trailed themselves for ever and ever, and never got uncoiled. It had a black canal in it, and a river that ran purple with ill-smelling dye, and vast piles of building full of windows where there was a rattling and a trembling all day long, and where the piston of the steam-engine worked monotonously up and down like the head of an elephant in a state of melancholy madness. (Dickens, 1966, p. 22)

In the above fragment, Dickens describes the filth and noise of an industrial town where buildings look unnatural and the trails of smoke rising from their chimneys seem endless and inseparable, to the point of obstructing the urban landscape from view. At the same time, there is no relief on the streets from the noises and the pollution caused by the factories. In other words, the results of industrialisation are simultaneously repugnant and ubiquitous. In *Pickwick Papers*, Dickens presents a similar characterisation for Birmingham:

> …the murky atmosphere, the paths of cinders and brick-dust, the deep-red glow of furnace fires in the distance, the volumes of dense smoke issuing heavily forth from high toppling chimneys, blackening and obscuring everything around; the glare of distant lights, the ponderous waggons which toiled along the road, laden with clashing rods of iron, or piled with heavy goods" […] "the whirl of wheels and noise of machinery shook the trembling walls. The fires, whose lurid sullen light had been visible for miles, blazed fiercely up, in the great works and factories of the town. The din of hammers, the rushing of steam, and the dead heavy clanking of engines, was the harsh music which arose from every quarter.
>
> (Dickens, 1967, p. 705)

In this segment, Dickens discusses industrial noise in conjunction with the bustle of activity in the town. The sights and sounds of industrialisation are disruptive for visitors to Birmingham, engulfing the town and so the manner in which the effects of industrialisation fill its façade is synonymous with urban landscape. There is no escape from the effects of industrialisation—they are ubiquitous and overbearing, and the fires of the factories are the first thing an individual will notice when looking around the town, as well as the first sight for the visitor approaching it. The noise and fires of industrialisation effectively act as a characterisation and a summary of the town. The second part of the paragraph in *Hard Times* concerns the complete similarity and in particular the lack of individuality of the industrial town:

> It contained several large streets all very like one another, and many small streets still more like one another, inhabited by people equally like one another, who all went in and out at the same hours, with the same sound upon the same pavements, to do the same work, and to whom every day was the same as yesterday and tomorrow, and every year the counterpart of the last and the next.
>
> (Dickens, 1966, p. 22)

This perspective is thus structured around perceptions of uniformity, pollution and waste. It should perhaps be mentioned that in this case uniformity is largely a manifestation of a world which is completely void of individuality and any kind of diversity, while also acting as a critique of urban concentration of labour, whereupon the workers are not individuals with their own personalities and habitual traits, but simply a mass of grey matter whose only function is to be part of the uniform workforce. Stevenson also quotes Hartwell in saying that "the rise of great industry led to the loss of freedom and skills, an intellectual and moral chasm between the rich and the poor and an ugly and brutish life in the industrial towns" (Stevenson, p. 238). This further underlines the previously mentioned concerns, as well as the widening gulf between different levels of society, whether they be assigned according to differences in economy or geography, i.e. whether the chosen contrast is that of the rich and the poor or of urban and rural. The problems with pollution in urban areas were particularly exacerbated by the dependence on coal (More, 2000, p. 144). Similarly, Ashton (1968) points out that the technical developments of the Industrial Revolution were in fact not beneficial for agricultural workers, as its benefits were to some degree restricted to urban areas (pp. 50–51), and the new machinery was not easily applicable to farming. As for the effects on individuals, Ashton states that the role of competition in determining wages and rents increased, and the standard of life of labourers increased in many areas, but simultaneously many families suffered because of the decline of rural crafts (1968, p. 52).

Another outspoken critic of the effects of mass industrialisation was Anna Seward (1742–1809), sometimes called the Swan of Lichfield, who was born in Derbyshire and spent most of her life in Lichfield, Staffordshire (Stapleton, 1909). At the time, Seward was considered the most famous poetess in England, and was also a correspondent of both Dr Erasmus Darwin, who was a member of the Lunar Society and the grandfather of the naturalist Charles Darwin, and Sir Walter Scott (Stapleton, 1909). In her poem *Colebrook Dale* (1785), named after Coalbrookdale, Shropshire, Seward presented a view similar to Dickens', albeit hers was more focused on the loss of a world of natural beauty and centred around rural rather than urban areas, with its first stanza initiating a portrayal of countryside landscapes in the wake of the effects of industrialisation:

> Scene of superfluous grace, and wasted bloom,
> O, violated Colebrook! in an hour,
> To beauty unpropitious and to song,
> The Genius of thy shades, by Plutus brib'd,
> Amid thy grassy lanes, thy woodwild glens,
> Thy knolls and bubbling wells, thy rocks, and streams,
> Slumbers! —while tribes fuliginous invade
> The soft, romantic, consecrated scenes;
>
> (Seward, 1810, p. 314, lines 1–8)

Seward immediately sets the critical, polemic tone of the poem by referring to Coalbrookdale through the epithets 'superfluous grace' and 'wasted bloom'. She then describes the natural beauty of Coalbrookdale and how it has been caused to erode through what she refers to as an invasion. Each element of the natural beauty of Coalbrookdale is decisively helpless in the face of this ill-fated change and is forced to simply assume the role of a bystander watching idly as the wonderous countryside is violated into submission. This is ultimately caused by sheer greed, as the Greek god of wealth, Plutus, acts as the catalyst of the transgression. The imagery towards the end of the first stanza, from line 20 onwards, is more specific in describing how this transgression manifests itself:

> —Now we view
> Their fresh, their fragrant, and their silent reign
> Usurpt by Cyclops;—hear, in mingled tones,
> Shout their throng's barge, their pond'rous engines clang
> Through their coy dales; while red the countless fires,
> With umber'd flames, bicker on all thy hills,
> Dark'ning the Summer's sun with columns large
> Of thick sulphureous smoke, which spread, like palls,
> That screen the dead, upon the sylvan robe
> Of thy aspiring rocks; pollute thy gales,
> And stain thy glassy waters.—See, in troops,

> The dusky artificers, with brazen throats,
> Swarm on thy cliffs, and clamour in thy glens,
> Steepy and wild, ill suited to such guests.
>
> (Seward, 1810, p. 135, lines 20–34)

This second half of the first stanza provides a direct perspective on how this violation of nature is happening. Such imagery as clanging engines, countless fires, thick sulphureous smoke and umbered flames infest natural serenity and harmony, thus destroying rural beauty. Additionally, these destructive elements act 'in mingled tones', i.e. in unity, causing an entire array of detrimental effects. The imagery used could well be descriptive of a cataclysmic disaster, and within the context of the poem, a cataclysm is exactly what is taking place, although it might be considered an exaggerated account. However, that which is a literal cataclysm, in the sense of a disaster which causes destruction beyond repair, is also metaphorical for the societal cataclysm caused by the Industrial Revolution. The destruction described in the poem is so immense that it even drowns out the sun by way of 'columns large of thick sulphureous smoke', which continue to spread and obscure everything else, thus causing an effect similar to that in Dickens' description of Coketown, but on an even larger scale.

The second stanza of the poem considers the notion that the detrimental effects of industrialisation and mechanisation are not confined to Europe, but are a global effect, affecting especially agriculture. This is manifested in "metallic veins" gleaming over Europe, and "Ceylon's breathing spice; Peruvian gums; Brazilia's golden ore" (Seward, 1810, p. 315).

> …might Britannia send
> From regions better suited to such aims,
> Than from her Colebrook's muse-devoted vales,
> To far resounding Birmingham, the boast,
> The growing London of the Mercian realm
>
> (lines 27–31)

Seward expresses lamentation over the choice of places of pastoral beauty like Coalbrookdale ending up as victims of industrialisation instead of places like Birmingham or London which might be more likely to withstand the destructive effects of the process. Additionally, the effects of already industrialised cities, such as Birmingham, are not confined to the cities themselves, but instead the scope of industrialisation extends far beyond local limits, which causes further damage to the area around Coalbrookdale.

In the third stanza of the poem, Seward discusses the contrast in the roles of labour and arts: Birmingham's neighbouring cities are "careless of art and knowledge" (Seward, 1810, p. 317, lines 51–52), and Birmingham itself is expanding at a rapid rate and illumined by intellect and "gay in wealth" (Seward, 1810, p. 317, lines 52–53). This concerns the idea of profligacy and carelessness in urban centres, which would also manifest through negligence of the natural world. Economic prosperity and greed essentially lead to a type of thinking where there is little consideration for the after-effects of industrialisation, but as it is economically fruitful, it is nurtured despite the decay it will cause. This relates to the concept of gluttony and greed leading to the relegation of essential but familiar elements of life, in this case natural beauty and agriculture, to being considered an encumbrance for further progress and thus unneeded and expendable. Consequently, flora is "upturn'd, disrooted, into mortar'd piles", with streets and squares being thusly realigned to be more symmetrical (Seward, 1810, p. 317, lines 57–59). This underlines the decay of flora—occurring both naturally and as caused by humans—on the fringes of the process of industrialisation. Romanticist ideals of green, lush vegetation are cast aside to accommodate for the rise of machines. Natural beauty is replaced by what is perceived to be modern, man-made beauty, in the form of symmetrical, uniform features, likely built of steel and marble. Similarly, naturally growing vegetation which requires upkeep to keep it from growing out of control is replaced by synthetically manufactured beauty, which can be controlled and can only be such as it is intended to be, and acts as an epitome of striving for perfection instead of natural progress. Essentially, classical beauty is replaced by modern beauty. Organic life can in this context be seen as growing independently and striving on chaos, whereas man-made beauty is pedestrian and still. Wildlife is no longer allowed to blossom, but instead mechanical features overrun pagan virtues.

The fourth stanza of the poem, occupying lines 60–66, takes a direct, critical look at the treatment of flora in the metal age, as the process of industrialisation could be referred to in this context: "…chemists bruise the shrinking leaves and flowers, whose steams saline, congealing swift on the recipient's sides…" (lines 60–62) and "wave after wave incrusts, till liquid change to solid, and support the volant foot" (lines 65–66). At this point, the approach of the speaker of the poem has moved from polemic to judgmental and condemning. Wildlife has lost its intrinsic value from the perspective of the industrialists, and its only value is in discovering new knowledge. It is, therefore, treated without any sort of reverence, and considered entirely expendable and even worthless.

The fifth and final stanza of the poem returns once more to the industrialisation process taking place in the cities, with the process overgrowing its location:

> Grim Wolverhampton lights her smouldering fires,
> And Sheffield, smoke-involv'd; dim where she stands
> Cricled by lofty mountains, which condense
> Her dark and spiral wreaths to drizzling rains,
> Frequent and sullied; as the neighbouring hills
> Ope their deep veins, and feed her cavern'd flames;
> While, to her dusky sister, Ketley yields,
> From her long-desolate, and livid breast,
> The ponderous metal. No aerial forms
> On Sheffield's arid moor, or Ketley's heath,
>
> (Seward, 1810, p. 318, lines 75–82)

In this stanza, Seward discusses the nature of the systematic decay of countryside and how the industrialisation process of the cities smothers the harmony of the countryside. Once again, the imagery used is related to artificial, industrial production and its refuse. Her mention of Ketley refers to Ketley Building Society, which was the first known building society, founded by Richard Ketley in 1775 (Building Societies Association, 2017). Through the use of Ketley's name, Seward accuses industrial managers of not only overlooking the decay of countryside, but also deliberately exacerbating its effects to suit their own financial and professional goals. By Seward's vision, industrial centres fail to recognise the beauty and value of the countryside they are surrounded by, and thus proceed to endanger it even further. It is not only flora which has suffered because of the process of industrialisation, but fauna as well, as there are "no aerial forms on Sheffield's arid moor", suggesting that there are no birds in the area anymore. The debilitating effects of what might be branded as industrial disease could in this case be considered biocide.

At the end of the poem, Seward issues a warning that if this progressive decay is allowed to continue, then "…to a gloomy Erebus transform the destined rival of Tempean vales" (Seward, 1810, p. 319, lines 95–96). In Greek mythology, which is the source for many of the metaphorical references in the poem, Tempe is a valley which is considered to be a place of sublime beauty. Erebus is in turn the place between Earth and Hades, the realm of the dead, and a place of complete darkness. Likening post-industrial landscape to a place of complete darkness and desolation is a device which portrays the effects of industrialisation as entirely calamitous, and industrial managers as people who are willing to completely destroy the natural beauty of the countryside in order to accumulate their wealth. In essence, Seward considers industrialisation to lead to the complete destruction of the Shropshire countryside, with complete desolation and devastation replacing the habitat of flora and fauna. This is ultimately an apocalyptic view which goes far beyond the simple dreary barrenness

described by William Cobbett. Klingender (1968) argues that it is in fact not the process of industrialisation which Seward objects against, but rather the "inappropriateness of landscape industry has invaded" (p. 73).

The nature of ominous and frightening structures and surroundings can also be considered to have a different part to play in art in which they are depicted; in his *Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful*, first published in 1756, Edmund Burke writes that "Whatever is fitted in any sort to excite the ideas of pain and danger; that is to say, whatever is in any sort terrible, or is conversant about terrible objects, or operates in a manner analogous to terror, is a source of the *sublime*; that is, it is productive of the strongest emotion which the mind is capable of feeling" (Klingender, 1968, p. 74). This perspective is a stark contrast to romanticist ideas which celebrate natural beauty and decry artificial elements which rupture and hinder the existence and harmony of pastoral landscapes. Instead, in the face of the Industrial Revolution, Burke's view supports the notion that such elements which are considered dark and ominous are in fact more relevant in the creation of art than pastoral landscapes and other subjects which may traditionally have been considered aesthetically pleasing, and elicit a more powerful reaction in the viewer, thus supporting the idea that the most important element of a work of art is whether it sparks an emotional reaction in its recipient, thus causing its relevance as a presenter of reality to be less important. Additionally, Burke's view of the sublime being the strongest emotion the human mind is capable of feeling would suggest that it should be the main aspiration of creative art. The 19th century saw a significant contrast between the two main approaches in art during the century; romanticism was the key perspective in the first half of the century, whereas the second half saw the establishment of the realistic approach. Romanticism was very much focused on traditional beauty, i.e. appreciation of natural beauty, seen across arts in the works of Ludwig van Beethoven, John Keats and Thomas Gainsborough. The role of romanticism was largely to present beauty and to cherish it, often to the degree of adulation. The contrast to realism was in the notion that the romanticist approach was very much focused on existing beauty and harmony, and therefore ignored that which was not perceived to be beautiful, or at least presented it in a manner which made it seem far more attractive than it really was. Realism was in turn focused on presenting existence without polish, which meant including and even highlighting its uglier aspects, and realistic works were often based around subject matters which were seen as negative, crude and unwanted. The realistic approach, the extreme degree of which is also known as naturalism, followed the mantra of presenting truth with complete honesty, sometimes to the point of being agonising and at the same time educational for the viewer, thus conforming with Burke's view of the importance and impact of emotional reaction. This is clear from the works of such artists as the French

writer Emile Zola, who depicted the lives of people working endlessly in the coal mining industry without being able to make ends meet, with no resolution other than accepting a life of squalor. In visual art, the difference between romanticism and realism is also present in subject matter, and this can be seen in the difference between paintings of the two eras in the 19th century. Landscape painting was largely dominated by pastoral landscapes which often described vast areas of natural beauty, for example hills and pastures. With the dawn of realism, the corrupt effect of industrialism on the same landscapes became a valid and relevant subject matter, and both the effects on the countryside as well as the less substantial but nevertheless permanent changes in urban areas were presented in great detail, underlining both the destructive and the constructive effects of industrialisation. This difference between traditions of portrayal of landscape can be seen in comparing two notable paintings dating from the dawn and the apex of the Industrial Revolution: Gainsborough's *Mr and Mrs Andrews* (1750) and Loutherbourg's *Coalbrookdale by Night* (1801). Of these, *Mr and Mrs Andrews* presents a rural, pastoral view, whereas *Coalbrookdale by Night* portrays the dark blaze and smoke of industry.

Fig. 1. *Mr and Mrs Andrews* (1750) by Thomas Gainsborough. Photo credit: National Gallery. All rights reserved.

Mr and Mrs Andrews presents an idyllic scene in the countryside, with the eponymous sitters located left of the centre of the painting to accommodate for the depiction of rural scenery. This effectively highlights the importance of the scenery, which could otherwise be a backdrop, but instead assumes an essential role in the painting. Thus, the sitters are also embellishments in the broader view of the

landscape, which also provides them with an aura of ownership over the surrounding land, as they present the scenery which is under their supervision. The landscape itself is presented as natural and largely untouched, with its greenery given space and allowed to flourish, seemingly far from the concentrated populace of towns. Near the centre of the canvas, sheep are grazing, largely in harmony with their surroundings, and acting as another detail in the landscape.

Fig. 2. *Coalbrookdale by Night* (1801) by Philippe Jacques de Loutherbourg. Photo credit: Science Museum. Reproduced under Creative Commons Attribution-NonCommercial-ShareAlike licence. Resized.

Coalbrookdale by Night is one of the most iconic images of the Industrial Revolution and portrays the effects of industry through the fire and smoke of furnaces which illuminate the night and fill the landscape with their luminous presence. The starkest contrast with *Mr and Mrs Andrews* would be in the use of colour—the landscape of *Coalbrookdale by Night* is dominated by reddish smoke instead of the lush green that would be typical of the English countryside. This image of smouldering fires relates directly to Seward's description of industry invading and violating Coalbrookdale:

> Through thy coy dales; while red the countless fires,
> With umber'd flames, bicker on all thy hills,
> Dark'ning the Summer's sun with columns large
> Of thick sulphureous smoke, which spread, like palls

(Seward, 1810, p. 135, lines 25–28)

Paintings like Coalbrookdale by Night also normalised the portrayal of ruddy industrial scenes by assuming the approach that there is more to landscape painting than merely portraying romanticist scenes which might be considered to elicit what would have been considered a traditional vision of beauty. Danahay (2000) writes that during the nineteenth century, the typical reaction to industrial fuel like coal in art was to either ignore it entirely or to reject it "as unnatural and a sign of environmental and moral decay" (p. 5). William Williams is considered to be the first painter to produce images of the Industrial Revolution (Danahay, 2000, p. 5), with his paintings *Morning View of Coalbrookdale, Shropshire* (1777) and *Afternoon View of Coalbrookdale, Shropshire* (1777) portraying mostly green, pastoral landscapes, the purity of which is interrupted by industrial smoke.

Fig. 3. *Morning View of Coalbrookdale, Shropshire* (1777) by William Williams. Photo credit: Shrewsbury Museum and Art Gallery. All rights reserved.

In *Morning View*, the smoke is produced by a single chimney near the centre of the picture, whereas in *Afternoon View*, there are several chimneys in close proximity filling the air with smoke, thus obscuring parts of the landscape and providing a visual version of Seward's description of Coalbrookdale. The trailing smoke fades into the sky, merging with the rural landscape.

Fig. 4. *Afternoon View of Coalbrookdale, Shropshire* (1777) by William Williams. Photo credit: Shrewsbury Museum and Art Gallery. All rights reserved.

Williams effectively merges the ideals of romanticism and paintings of industrialisation in his portrayal of industry surrounded by natural beauty, contrasting rich, lively green with the greyness of the smoke rising from the chimneys. In this case, there is a sense of harmony between industry and natural scenery. The duality of destructive and constructive is an important aspect of industrialisation—while it can be argued that the Industrial Revolution resulted in much grime and

suffering, it did also usher in a new era which inevitably changed society permanently. In essence, paintings in the realistic tradition drift away from the imagined perfection of pastoral scenes towards more realistic documentation of then-contemporary scenery.

Regarding historical perspectives concerning the Industrial Revolution, Stevenson (1993) states that "there has been a shift in emphasis in writing about the social aspects of industrialization from a concentration upon the impact of change in the most advanced sectors of the economy towards a broader and more balanced assessment of society as a whole" (p. 231). This essentially means that the focus of historical analysis of the Industrial Revolution has shifted towards realities concerning the lives and statuses of people and away from the development of new machinery. Stevenson adds that recently, historians have been increasingly inclined to take the relationship between changes in economy and society during the Industrial Revolution into account instead of focusing on the economic changes alone (pp. 231–232). The role of common people as participants in the Industrial Revolution has thus come under further inspection in the study of history. In essence, the technological advancements of the Industrial Revolution are not considered the only subjects of study, but its effects on society have come to be considered increasingly important in the field of research.

The Industrial Revolution has also been said to have born out of the agricultural revolution as its natural progression. For example, Zmolek (2013) writes that while the period of time from 1760 to 1820 is considered the first wave of the Industrial Revolution, the most impressive area as regards economic performance was in the rate of increase in agrarian output, which was helped by the spread of innovations in agriculture (Zmolek, 2013, p. 253). The 1760s acted as a turning point in the textile and iron industries, which further supports Toynbee's view of large-scale changes in commerce taking place from that point onwards (Zmolek, 2013, p. 330). However, the key features of the agricultural revolution "developed gradually over a long period" and "at widely different periods in different regions" (Deane, 1969, p. 37), and so these large-scale changes cannot be considered to have taken place in a sudden manner across the country. This notion is further supported by Gregg (1965), who writes that the agricultural revolution was stifled by lack of communication due to geographical distance and the unwillingness of farmers to adopt new methods, owing to both financial reasons and general conservatism (p. 25–26). Regarding the relationship between the Industrial and Agrarian Revolutions, Deane (1969) also writes that the agricultural revolution and the process of industrialisation were both part of the larger process of economic transformation that is known as the Industrial Revolution, and the changes in the fields of agriculture and manufacturing were largely similar (p. 45). The Industrial Revolution is often considered a revolution in the application of new

machinery, but the agricultural revolution depended on new technologies and their widespread use as well. Deane (1969) writes that "in a pre-industrial economy technical progress tends to be exceptional and intermittent. In an industrialized economy it is accepted as part of the normal order of things" (p. 118). This is indicative of the relationship between the agricultural revolution and the Industrial Revolution: the Industrial Revolution can be considered a continuation of the agricultural revolution instead of a separate era of change, with the process of the application of new tools continued and expanded into urban areas and urban works. However, there are notable differences between the two, in particular in their geographical concentration: the agricultural revolution is deemed to have taken place as a general, gradual change which has been applied in wide regions, whereas the Industrial Revolution can be said to have taken more defined steps and which has focused on urban areas, thus concentrating the radius of its significance on specific locations, in this case cities. Additionally, the terms are not always used exclusively, and so strict definitions separating the two revolutions from one another are contentious. In conclusion, it can be argued that since the Industrial Revolution was not only shaped by the Agrarian Revolution and dependant on the changes it caused, but also effectively progressed the changes that had taken place within the Agrarian Revolution, the Industrial Revolution was the next step after the Agrarian Revolution, and thus its continuation.

Technical progress as "the normal order of things" is a particular notion on the constant change in machinery during the first half of the 19th century, as the application of steam, in particular, took place in stages, with steam eventually becoming integral to society, from being the foundation of transportation to being depended upon in grinding mills (Deane, 1969, pp. 121–122). The technical transformation was most evident in the textile industries and in the metal-using industries (Deane, 1969, p. 121). The key inventions which were essentially catalysts for the advances in technology during the Industrial Revolution were the spinning jenny and the steam engine, both introduced in the 1760s (Zmolak, 2013, p. 328, 331). The jenny made it possible "to work eight, and later as many as a hundred spindles by a single wheel, whereas the old spinning wheel worked one spindle and one alone", and is usually credited to James Hargreaves (Zmolak, 2013, p. 328). While the jenny did increase production substantially, it initially had little effect on the organisation of the industry, as rovings still had to be made on a hand wheel and the thread produced with the jenny was only suitable for weft (Pinchbeck, 1969, p. 116). The steam engine, in turn, was instrumental in enabling the final stage of the Industrial Revolution to happen, as it enabled the development of large-scale of industry to take place (Mantoux, 1961, p. 337).

Walsh (2004) writes that towards the end of the 18th century, there was a growing sense of nostalgia towards rural views and untainted or unindustrialised nature (p. 5). At the same time, public awareness of the role of impoverished people in industrial society increased (Walsh, 2004, p. 5). This suggests that while the Industrial Revolution was seen as inevitable and perhaps in some ways a natural progression, people eventually recognised the dire effects it had on society and on nature, and these effects were later criticised by polemicists like Cobbett and Seward. The perspective of squalid industrialisation overriding pastoral nature is already present in the Irish poet Oliver Goldsmith's *The Deserted Village* from 1770. The poem begins with a description of the pastoral beauty of the village:

> Sweet auburn, loveliest village of the plain,
> Where health and plenty cheared the labouring swain,
> Where smiling spring its earliest visit paid,
> And parting summer's lingering blooms delayed,
>
> (Goldsmith, 1950, lines 1–4).

Initially, the village acts as a refuge for a tired worker, who can rest peacefully in the meadows after toiling, and both spring and summer, the seasons of warmth and floral growth, seem longer than elsewhere. The village is also a centre of pastoral entertainment for the speaker: "*How often have I paused on every charm, the sheltered cot, the cultivated farm, the never-failing brook, the busy mill*" (Goldsmith, 1950, lines 9–11). However, this is all deemed to be a memory of the past, as the village has changed as it has lost its beauty: "*These were thy charms—but thy charms are fled*" (Goldsmith, 1950, line 34). Instead of lasting pastoral beauty, the charms of the village have been caused to withdraw (line 36), and this has ultimately led to the destruction of the beauty of the countryside: "*Amidst thy bowers the tyrant's hand is seen, and desolation saddens all thy green* (Goldsmith, 1950, lines 37–38). The 'tyrant' who is described as the entity who has destroyed the natural beauty of the village, is a personification of the continuous and relentless abuse and mistreatment of the countryside, and has caused the small joys of the pastoral scene to disappear altogether:

> One only master grasps the whole domain,
> And half a tillage stints thy smiling plain:
> No more thy glassy brook reflects the day,
> But, choked with sedges, works its weedy way.
>
> (Goldsmith, 1950, lines 39–42)

As in Seward's *Colebrook Dale*, Goldsmith describes the decay of countryside as a consequence of abuse and neglect: "*Sunk are thy bowers in shapeless ruin all, / And the long grass o'ertops the mouldering wall*" (Goldsmith, 1950, lines 47–48). The long grass growing beyond the top of the wall is a particular example of how neglect on the part of humans has contributed to the degradation of nature. However, unlike Seward's cataclysmic view, this is a case of neglect leading to overgrowth instead of

lifelessness; in this view, natural beauty has lost its value for humans and so they let it grow instead of taking care of it. This can be seen as the result of a choice having been made to focus and nurture artificial, man-made beauty instead of natural beauty, leading to flora growing aimlessly and randomly, as happened in Seward's *Colebrook Dale*. Those humans who still respect and adore the landscape decide that the pastoral age is over and so decide that they must leave it behind, as it is no longer the place where they grew up and which they loved: "*And trembling, shrinking from the spoiler's hand, far, far away, thy children leave the land*" (Goldsmith, 1950, lines 49–50). The choice to allow the countryside to degrade to permanent decay is purely down to greed: "*Ill fares the land, to hastening ills a prey, / where wealth accumulates and men decay*" (Goldsmith, 1950, lines 51–52). The speaker of the poem also underlines the emphatic difference between the lifecycles of humans and nature: *Princes and lords may flourish or may fade; / A breath can make them, as breath has made* (Goldsmith, 1950, lines 53–54). Effectively, human lives come and go, and in their employment, when the time is right for them to leave, they will be replaced by others who are able to take their place. However, "*a bold peasantry, their country's pride, / when once destroyed, can never be supplied*" (Goldsmith, 1950, lines 55–56), and so the work done by the peasantry in the countryside is deemed to be irreplaceable, and after the peasantry have left the countryside, there is no one who can take their place and look after the countryside. This essentially conveys the idea that continuous, unhinged decay will eventually result in the absolute ruin of the countryside, at which point nothing can be done to remedy the situation, and so all possible precautions should be taken to avert such a cataclysm of pastoral life, but as a result of human negligence, no steps of that sort are taken.

3.3 The Worker of the Industrial Revolution—from slavery to anarchy

Historians have not been in full agreement when debating the nature of the Industrial Revolution, as the role of the factory worker as a victim of industrialisation has attracted opposing views. Checkland (1979) writes that in the early stages of the 19th century it was still likely that a worker might improve his standing within the company he was working for and a common factory worker might ascend to the status of an entrepreneur. However, from the 1820s onwards, the possibilities for such progressions became far less likely to exist, with textile workers starting small businesses which usually ended in failure. There was another manner of business which did gain ground, however, this being sub-contracting, where a manager would delegate work to groups of workers, and this was a common practice in iron founding, coal mining and ship construction, along with some other fields. (Checkland, 1979, pp. 219–220) Checkland (1979) also states that many workers with humble backgrounds managed to attain a position of power within a company, whereas people who had

mostly inherited their wealth and their position chose to explore other fields, which provided the less privileged workers with the opportunity to claim a position of power within a company (p. 221). More (2000) suggests that the blame that is often placed on industrialisation should instead be placed on capitalism due to industrialisation being used to create jobs which paid better wages than jobs before industrialisation. However, at the same time, the availability of these jobs was due to the capitalistic market mechanism (p. 142). Regardless, the nature of employment changed significantly during the Industrial Revolution.

Checkland (1979) writes that a key difference between the working conditions of agricultural work and factory work from the perspective of the worker was that in agriculture, there were limitations imposed by nature, whereas in the controlled environment of a factory, the managers could freely decide the workload of their employees (p. 244). It can then be said that in shifting from rural to urban surroundings, the disciplines involved in working life changed from being dictated by nature to being dictated by people. Additionally, the people in Parliament were largely oblivious to the rapid advancements in the industrial sector, and this in turn meant that factory conditions would continue to exacerbate. Issues surrounding working conditions in factories during the 1840s included bad ventilation, high temperatures, bad materials, long hours and most significantly the speeding up of the machinery to increase the tempo of the workers. These aberrations led to shortening of working life, as diseases, tuberculosis in particular, thrived in the exhausted bodies of workers. Deane (1969) points out that death rate in England increased notably in the first half of the 1800s, and this was due to the influx of people into towns, exacerbating the effects of towns having outgrown the existing technology of urban living (p. 242). Infectious diseases alone were the cause for more than half of the deaths nationwide, with diseases, malnutrition and overcrowding causing half the children born in towns to die before the age of five (Deane, 1969, p. 242). As towns expanded geographically and their populations continued to increase, sanitation systems became more and more inadequate, with sewage sometimes flowing into rivers used by water companies as fresh supply (Deane, 1969, p. 243), thus increasing the already high level of contamination. The brevity of working life of individual workers led to employers discarding expiring adults and they decided to instead rely on children and youngsters. However, children suffered because of the repercussions of factory conditions as well, since young mothers were unable to properly attend to them after exhausting themselves working in the mills. While the inhumane working conditions first came to public attention through textile mills exposures, the 1842 *Report of the Commission on the Employment of Women and Children in Mines and Collieries* revealed that the situation was far worse than was thought before, as the owners of enterprises refused to take responsibility for their workers and workers had no means to alleviate their

conditions and instead largely tried to excel in the system which was destroying them (Checkland, 1979, pp. 244–248).

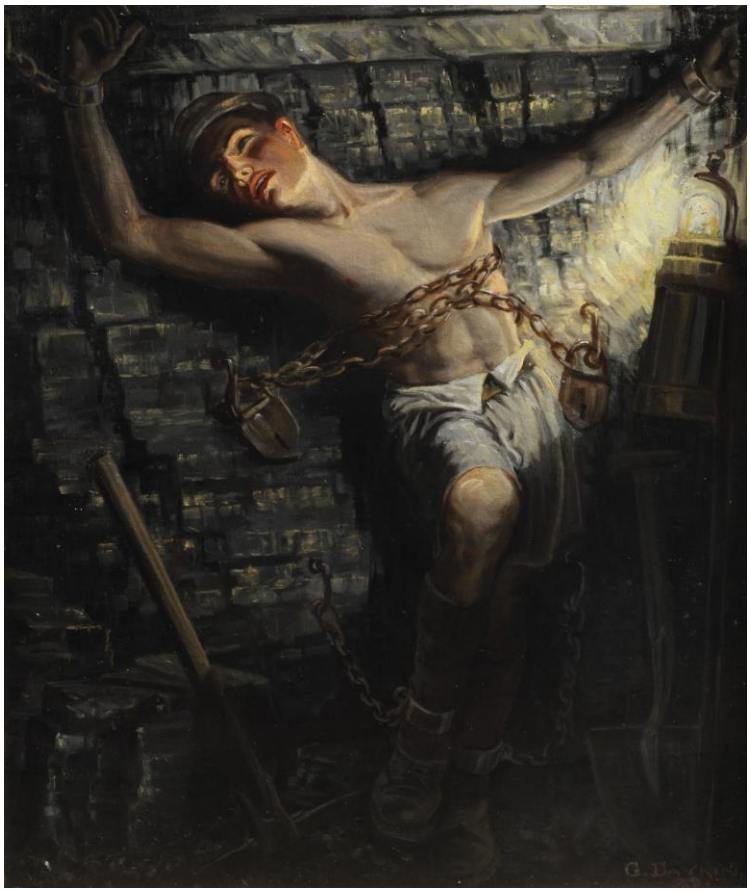

Fig. 5. *Symbolic: The Miner Enslaved* (1938) by Gilbert Daykin. Photo Credit: Science Museum. Reproduced under Creative Commons Attribution-NonCommercial-ShareAlike Licence.

The status of a worker in a coal mine is exemplified in Daykin's *Symbolic: The Miner Enslaved*, where a collier is bound to a wall with locked chains around his feet, abdomen and wrists with his arms stretched out horizontally slightly above shoulder level, thus reminiscent of the image of Christ on the cross, accentuated by his helmet assuming the role of the crown of thorns. Daykin's father was a miner before him, and he started working in mines himself at the age of 13, and eventually died in a mining accident in 1939, the year following the completion of *Symbolic: The Miner Enslaved* (Barnsley Art on Your Doorstep). Daykin's art consisted largely of underground mining scenes, many of which focused on the physical aspect of a miner's work. As a miner himself, Daykin knew the realities of work in the coal mines, and was able to transfer the predicament of mining into his art. The position of the miner being chained to the wall in *Symbolic: The Miner Enslaved* indicates that the miner is destined to work in the mines for his entire life, as Daykin did, and he would have no other prospects for future to think of. Additionally, highlighting the concept of enslavement in the

title of the painting asserts that the miner is not merely trapped in the life of a collier, but also a drone who is caught in the reality of continuously returning to a life of labour without having an option to detach himself from the rigorous labour in the mines. The fact that Daykin himself died in a mining accident adds a certain fatalistic tone to the painting, with the miner not simply being tethered to the mines in his working life, but also destined to die there, surrounded by the darkness of the mining pit which has been his daily reality for most of his life. The miner knows that the system under which he toils is harmful to him, but he nevertheless perseveres with his work, only to eventually expire with little or no reward. Relating the miner's predicament to Christ being crucified also suggests that the miner has been abandoned in his darkest hour, left to rot in insurmountable darkness, and helpless despite no fault of his own.

As a result of the previously mentioned revelations in the *Report of the Commission on the Employment of Women and Children in Mines and Collieries*, women and children were removed from work below ground level as part of the Mines and Collieries Act of 1842, which led to women progressively replacing men in the textiles industry (Checkland, 1979, pp. 244–248). Hand spinning, in particular, was seen as work that would be done by women and children (Pinchbeck, 1969, p. 129). The abhorrent working conditions of textile mills could also be the source of the phrase '*dark satanic mills*' in William Blake's poem *And did those feet in ancient time*, later used as the words for the Jerusalem hymn. In Blake's poem, the dark satanic mills act as a contrast to the "pleasant pastures" and "mountains green" of England, and therefore represent another example of the evils of industrialisation being detrimental to the pastoral beauty of the English countryside. In the poem, the phrase '*dark satanic mills*' as the end of the second stanza also acts as a contrast to the more benevolent imagery of Jesus walking around the pastoral landscapes of England in the first stanza:

> And did those feet in ancient time
> Walk upon England's mountains green?
> And was the holy Lamb of God
> On England's pleasant pastures seen?
>
> And did the Countenance Divine
> Shine forth upon our clouded hills?
> And was Jerusalem builded here
> among these dark Satanic Mills?
>
> (Blake, 1967, p. 375).

This acts as an accentuation of the detrimental effect of the mills, as not only are they seen as 'satanic', and thus juxtaposed with damnation, but they are also an element which disrupts the naturally beautiful features of the countryside. Additionally, as man-built structures, they are unnatural and thus also unholy when considered with the traditional view that God created a naturally beautiful world which humans should revere and treasure, whereupon that which is not created by God or for purposes of worship is by default unholy. Descriptions of pastoral surroundings—green mountains, pleasant pastures and clouded hills—are followed by the mention of the Satanic Mills, thus also suggesting a sense of progressions, or indeed decay, as the mills have become the feature identified as the core feature of the landscape and thus resigned examples of natural beauty into being mere relics and memories. The mills essentially interrupt the unity of pastoral features.

As for the status of the agricultural worker, William Cobbett describes their houses as "beggarly to the extreme" and the people "dirty, poor-looking; ragged", as he observes a rural site in which corn is abundant (Cobbett, 2001, p. 163). Cobbett also states that "the richer the soil, and the more destitute of woods; that is to say, the more purely a corn country, the more miserable the labourers", and all this is caused by the gulf between the poor and the rich, as the rich have control over the dwellings of the poor, and so there are "no hedges, no ditches" … "a few trees surround the great farm-house. All the rest is bare of trees; and the wretched labourer has not a stick of wood, and no place for a pig or a cow to graze, or even to lie down upon." Cobbett concludes his observation of this farm scene by asserting that "[I]t is impossible to have an idea of any thing more miserable than the state of the labourers in this part of the country" (Cobbett, 2001, p. 163). Cobbett's testimony highlights not only the imbalance between the rich and the poor, but also the complete lack of control the poor have over their lives and their surroundings, something which is caused by their subservience and their incapability of influencing the way they live, being instead constrained to a day-to-day life of barren dreariness. Cobbett (2001) writes of "a shocking decay; a great dilapidation and constant pulling down or falling down of houses. The farm-houses are not so many as they were forty years ago by three-fourths" (p. 36). Gregg (1965) finds that the Agrarian Revolution effectively destroyed the English peasantry due to laws and regulations along with low wages and general disregard for the status of the poor causing them to live destitute lives whereupon they would not be able to provide for themselves or their families (pp. 30–35). The peasantry was thus left in a predicament where they continued to toil whilst a system which they could not affect in any way made both work and life increasingly more difficult for them, eventually leading to the downfall of the English peasantry.

In *The Wealth of Nations*, Adam Smith writes that, as a general rule, the unproductive class of merchants, artificers and manufacturers is maintained and employed by the two other classes, these being cultivators and proprietors. These two classes effectively provide the unproductive class with the materials of its work and the funds with which they can sustain their work, and the unproductive class in turn provides cultivators with tools to improve how they undergo their work. (Smith, 1962, pp. 162–163) Smith's use of the epithet 'unproductive' in this classification refers to the perspective that the produce of merchants, artificers and manufacturers only replaces the stock which employs them, and so their profits only serve to maintain the existing powers of production (Smith, 1962, p. 160). Smith also states that in the political economy of the more advanced countries of late 18th century Europe, the industry of towns was favoured over agriculture, and this in turn caused other countries—that is, less advanced European countries and countries outside of Europe—to follow a different path, meaning that they would support agriculture rather than urban industry, and he uses China as an example of this kind of thinking (Smith, 1962, p. 173). Thus, Smith argues that the transition from rural to urban production was essentially a political development, not a gradual change that would have been largely dependent on the more general changes in society of the time, as argued elsewhere at times.

The urbanisation of industry happened inadvertently, as factories and depots were simply built in urban areas, and the new industrial population moved there accordingly, which led to diseases flourishing, as people essentially wore, drank and breathed refuse, the air was defiled and its movement restricted by crowded buildings, the sewage system was largely on the surface and disposal of waste was uncontrolled (Checkland, 1979, pp. 251–253). This would assert that industrialisation effectively exacerbated the poor standards of cleanliness in such a way that urban society was condemned to a level of degradation which would result in widespread outbreaks of disease, turning industrial towns into centres of plague-like regression of sanitation, affecting workers and non-workers alike in the towns where industrialisation kept progressing in rapid fashion. However, as Thomis (1974) remarks, "there was a limit to how far employers and governments could afford to neglect social amenities and welfare if they were to retain an economically productive work force" … "and so health and happiness were eventually seen to be worth pursuing on grounds that made sense in economic terms" (p. 51). Therefore, the health and well-being of both workers and people living in urban areas, was seen as a mere distraction from the production taking place in factories, and only adhered to when there was a risk of its negligence compromising production values, which makes it quite clear that the priorities of industrial managers were focused on production and not

people. This also means that there would only be so much focus on health and well-being as was necessary in order to maintain production levels, or even to stop them from dropping too significantly. Thomis also notes that the quick growth of population in specific areas, these being industrial towns, made the processes of water-supply and sanitation even more complicated (p. 63). Regarding the effects of transitioning from primarily rural work to primarily urban work, Wrigley (1967) writes that another key element which accelerated this change was the correlation between factory production and heavier transport systems—as transporting coal was much more complicated than transporting grain, more reliable means of transport had to be operated, leading to increased investment in conveyance (p. 101). Increase in the use of coal as an alternative for wood was an important factor in this application of heavier transport (Wrigley, 1967, p. 105). Reliance on coal and the need to transport it cost-efficiently was in turn an important element in the development of railways.

Workers displayed worries and grievances about the developing technology in their own right. Thomis (1974) states that it has been concluded in the study of social history of the Industrial Revolution that workers' resistance to technological change was often enough to inhibit new innovations from being introduced to the place in which they worked (p. 75), and so the managers valued their employees enough to allow them to have an influence on this matter. Regarding the general impact of the workers on the Industrial Revolution, Thomis writes that this resistance to technological change has been considered responsible for many delays in the introduction of new technology, but its scope and importance has also been overstated, and the reasons behind it were not political, but instead the result of workers being worried over their employment status (pp. 75–80). As for the nature of advancements in factory technology, Hawke (1993) states that such developments were not systematic, but mostly a result of the empirical method, and the scope of advancements was largely due to there being "time and opportunity in a relatively rich society to experiment with new ways of doing things" (pp. 61–62).

Managers effectively had complete control over the workers. The status of workers in the eyes of the managers was entirely down to the perception of their usefulness. Engels (1845) writes that the worker "is regarded in manufacture only as a piece of capital for the use of which the manufacturer pays interest under the name of wages" (p. 77). Engels also considered industrialisation to mark the beginning of the English proletariat, with the Industrial Revolution altering the entire civil society and concurrently shifting the worker's labour from taking place within his family to taking place in a factory (p. 55). Therefore, the worker moved from a situation where he was in control and could ordain the manner in which work is to take place to working under someone else's rule in a factory.

With the advent of factory life, time had a far more significant role than before, as it was to be measured in accordance with the units of production, and not simply by the time of day or the amount of sunlight, as would have been appropriate and customary in agriculture. As a result, humans became just another cog in the great machine of mechanical process (Deller, 2013, p. 32):

> In reality there were no regular hours: masters and managers did with us as they liked. The clocks at the factories were often put forward in the morning and back at night, and instead of being instruments for the measurement of time, they were used as cloaks for cheater and oppression. Though this was known amongst the hands, all were afraid to speak, and a workman then was afraid to carry a watch, as it was no uncommon event to dismiss any one who presumed to know too much about the science of horology."
>
> (Anon, *Chapters in the Life of a Dundee Factory Boy*, 1887)

Exercising fear and oppression as tools of controlling hands in such a way indicates a clear divide between workers and managers. The idea of instantly dismissing anyone who was perceived as too knowledgeable of the passage of time could well be considered tyranny exercised by the managers in keeping the hands in a position where they could not act as anything more than impersonal cogs in a machine for fear of having their livelihood taken away from them without as much as a chance to plead their case. The entire question of us and them would then lead the spiral of discontent to escalate further to the point where workers would in fact take direct action in their opposition to the process of industrialisation. With the changes in the process of labour and in particular factory work being seen as malign and hostile, this might lead to the attitudes towards the process of industrialisation to adopt similar feelings of animosity. The abuse of time in forcing workers to work more hours than they should is in turn an implication of machinery rather than human individuals being granted control: masters and managers could respond to protests by simply invoking the time denoted by the factory clock. This would have functioned as whitewashing the managers of their mistreatment of workers, projecting blame away from themselves to an inanimate device against which the workers could not argue.

The workers were forced to exist in a state where they suffered from the predicament of their livelihood being dependent on factory work and any kind of opposition therefore being perceived as a foolhardy gamble. However, opposition to the changes in industry did give rise to direct action on the part of workers, for example in Lancashire in October 1779, where the Irish boycott of English manufacturers caused a slump in the trade of cotton. Workers engaged in machine-wrecking as well: Klingender (1968) discusses Wedgwood's recollection from a letter to his colleague Bentley:

> Travelling to Bolton he had met a crowd of some 500 workers on the road who told him that 'they had been destroying some engines, & meant to serve them all so through the country'. Workers marched, 8000 strong, 'to beat of drum and colours flying' to the fatal mill (Chorley, partnered by Arkwright—they tried the week before, but were beaten out with the loss of three lives, spending the weekend arming themselves and reinforced by the Duke of Bridgewater's colliers and others) and destroyed it completely. The next Tuesday, the same mob entered Bolton about an hour after Wedgwood had left and destroyed every spinning-machine with more than twenty-four spindles.
>
> (Klingender, 1968, pp. 93–94)

Machine-wrecking was therefore not a simple uncoordinated course of action taken by a small group of contrarians, but rather a systematic, planned force of resistance taken by a united troop of unhappy workers, who would not accept the progression which was taking place. Later, in 1811–12, the entire manufacturing north was cast into a state of alarm by the Luddite riots. Klingender (1968) writes that the role of machinery in this equation was that of a "weapon which the employers were using to discipline the workers and subject them to their will. The more skilled the workers were who resisted the employers' claims to regulate their lives, the more anxious were the latter to speed up the process of mechanisation." (pp. 94–95) In this equation, the workers would resist the mechanisation of industry, and the managers would do what they could to not only undermine the workers' efforts, but also to increase the scope of mechanisation at the same time. This would of course in turn incite the workers to struggle even harder to limit the degree of industrialisation.

4 Materials

In this section, I introduce the painters whose works are under study in this dissertation in order to discuss their significance as painters of the Industrial Revolution and the relevance of the paintings involved. Additionally, these synoptic biographies of the painters aim to take into account and clarify how the Industrial Revolution related to the lives of the painters themselves.

Joseph Wright of Derby

Joseph Wright (1734–1797) was born and spent most of his life in Derby, which is why he is usually referred to as Joseph Wright *of Derby*, though these names are also used interchangeably. Originally, he had intended to become an engineer, but his father persuaded him to pursue a career in art (*The Garlick*, 1965, p. 83). However, his interest in technology did not desert him, and advancements in machinery are a very important element in his genre paintings. It should perhaps also be noted that in the early stages of the Industrial Revolution, Derby was an important industrial city, and this in turn likely influenced Wright of Derby's work. Wright of Derby was predominantly a portrait painter, but also painted some landscape paintings and some genre paintings, usually using oils. Gaunt (1971) writes that "Wright has been described as the first painter to express the spirit of the Industrial Revolution" (p. 233), and this view is shared by Klingender (1968, p. 51). Regarding the industrial setting of Wright's work, Gaunt states that in that early stage of the Industrial Revolution, economics had not yet had a destructive effect on society, but it was rather an age of experimentation and innovation (p. 55), and so Wright's perspective was bound to be different from that of later painters of the Industrial Revolution, and reflect a softer, more optimistic view. Klingender (1968) also states that Wright's *Philosopher's Lecture on the Orrery*, *Experiment on the Bird in the Air Pump* and *The Alchymist* were "the first paintings to express the enthusiasm of the eighteenth century for science" (p. 54). Wright's reputation as a painter of industrialisation is also the reason why the majority of the works analysed here are his.

Wright's work and approach to painting about technological subjects was also influenced by the Lunar Society, a circle of scholars and thinkers who would regularly meet to discuss scientific and otherwise relevant intellectual pursuits. Wright of Derby was acquainted with members of the Lunar Society, and so would have been able to gain information about the most recent developments in technological innovations. Fraser (1979) points out that due to Wright's status as a painter as opposed to the scholars of the Lunar Society, it would have been unlikely that he might have attended actual meetings of the Lunar Society (p. 2). Although he probably was not a member of the society, Wright

included the full moon in several of his industrial paintings—this is seen in *The Alchymist*, *the Philosopher's Lecture on the Orrery* and *An Experiment on the Bird in the Air Pump*, for example—and the meetings of the Lunar Society took place on the Monday that was nearest to the full moon (Egerton, 1990, p. 15). Although the society was a scholarly venture, most of Wright's scientific paintings depict common people being fascinated with science. This can be considered a representation of the world of science becoming closer to common people, and so there would no longer be a rift between the two. Egerton (1990) writes that demonstrations such as the one in Wright's *Experiment on the Bird in the Air Pump* were entirely common at the time (p. 16).

J.M.W. Turner

Joseph Mallord William Turner (1775–1851) is often considered the greatest artist in the history of British painting. As a child, Turner lived in Brentford with his uncle for four years, during which time he attended Brentford Free School, and started to copy landscape engravings. Turner was admitted to the Royal Academy Schools in 1789 and exhibited at the Academy for the first time in 1791 with two watercolours. During his early career, Turner did not show much originality in his works, instead copying drawings made by contemporary painters like Thomas Girtin. Turner's works were regularly exhibited at the Royal Academy from 1791 to the last years of his life. He also received support from the Academy against critics. At first, Turner only worked in watercolour—he eventually started working with oils in 1796, with his most notable works also painted with oils. (Garlick, 1965, p. 76) Turner is known especially for his impressionistic visions of the effects of speed, wind and waves. Many of his works focus on sailing, bringing these effects to life. As a painter, Turner was significantly influenced by the French painter Claude (Garlick, 1965, p. 12), and to a lesser degree, Richard Wilson and Rubens (Garlick, 1965, p. 77). While Turner did not paint directly from nature, his works contained many qualities which would later be considered key elements of Impressionism (Garlick, pp. 77–78). To critics of Turner's time, his paintings seemed incomplete, with forms that were not well defined and sections which were indistinct, as well as his use of colours contrasting with that of other painters of his time (Hirsh, 1969, pp. 58–59). Rodner (1997) remarks that Turner was born at a time of great changes in industry, such as the expansion of factory cities and the introduction of new means of production, and perhaps most relevantly the advent of a new age in transportation as railroads were introduced and steamboats overruled the age of sail, both of which played a part in some of Turner's most famous works, *The Fighting Temeraire* and *Rain, Steam and Speed* (p. 1).

Turner's impact as a painter of the Industrial Revolution is not limited to paintings which directly portray the changing of eras, however, as his depictions of landscapes display the effects of industrialisation as well. For example, Klingender (1968) argues that "the image of the industrial revolution as a whole was summed up by Turner in his view of 'Newcastle-on-Tyne'" (p. 85).

Fig. 6. *Newcastle-on-Tyne* (1823) by J.M.W. Turner. Photo credit: Tate Gallery. Reproduced under Creative Commons Attribution-NonCommercial-NoDerivatives licence.

Hofland writes that at the time, Newcastle was known for its abundance of collieries and its assembly rooms, and Turner's painting characterises the prosperity, science and the enterprising spirit of the city (Rylance-Watson, 2013). Regarding the artistic elements of the painting, Rodner highlights the interplay between the old-city district and the effects of industrialisation in the painting, with the grey haze in the background of the painting contrasted by the richer colours in the foreground (Rylance-Watson, 2013). Klingender's view of the painting representing the Industrial Revolution as a whole would be drawn from the collective existence of the vapours of industrialisation and the less laborious life continuing in the painting in the form of sailors and civilians idly sitting by the river, and boats going about their business of having their cargo unloaded alongside other activities taking place. There is a general air of cohesion in the painting alongside an atmosphere of activity, which might be

indicative of an idea of the Industrial Revolution bringing prosperity and thus contentment into the city, without its grime taking over and causing deterioration in health and workers' rights.

Ford Madox Brown

Ford Madox Brown (1821–1893) was born in Calais and was an important influence for the Pre-Raphaelite Brotherhood. Madox Brown's grandfather, John Brown, had been a physician, and Hueffer (1896) argues that the two were similar in that they were innovators who went against existing traditions and found their own style through experience and independent study (p. 2). Madox Brown started developing an interest in art at the age of six or seven and started learning from a drawing-master at the age of seven, copying the works of Raphael and Correggio (Hueffer, 1896, pp. 12–13). In his early teens, he studied under several different art teachers and painted portraits of his family members, although according to Hueffer (1896), his teachers mostly managed to stifle his innate creativity (p. 14). Soon afterwards, Madox Brown moved from Calais, where he spent his childhood, to Antwerp in Belgium to study at the Antwerp Academy. Madox Brown was never an official member of the Pre-Raphaelite brotherhood, but is seen as a precursor to their approach to painting and was well acquainted with individual members of the brotherhood (Hueffer, 1896, pp. 61–62), especially its founder, Gabriel Rossetti, who was a close friend and a former pupil of his (Hueffer, 1896, pp. 50–52). From the perspective of the Pre-Raphaelite Brotherhood, British art had deteriorated and lost its integrity through the use of artificial embellishments and a lack of representation for truthfulness (Rosenblum & Janson, 1984, pp. 255–256). It has also been argued that Madox Brown was himself influenced more by the Pre-Raphaelite Brotherhood than vice versa (Garlick, 1965, p. 22).

Fig. 7. *The Last of England* (1855) by Ford Madox Brown. Photo credit: Birmingham Museums Trust. All rights reserved.

The Last of England depicts a couple leaving England in a boat with people of varied social statuses in order to find a new start to their life somewhere else. The concept of the painting was influenced by Thomas Woolner, a Pre-Raphaelite, who emigrated to Australia in 1852, while approximately 370,000 other people left Britain that year to find better fortune elsewhere—Madox Brown considered moving to India himself due to financial difficulties (Fowle, 2000). Madox Brown posed for the painting himself, along with his wife and children (Birmingham Museums and Art Gallery). In his catalogue entry, Madox Brown described the painting's couple as "depressed enough in means to have to put up with the discomforts and humiliations incident to a vessel 'all one class'" (Fowle, 2000). The name of the vessel is Eldorado (Fowle, 2000), pointing at the passengers' shared wish of reaching a place far from home where they can find and nurture a live of prosperity. The painting represents the depression caused by the Industrial Revolution and its debilitating effects on the lives of people.

5 Analysis of the selected paintings

In this section, I discuss and analyse the paintings which are the subjects of study in this thesis. Each painting is discussed separately in order to maintain clarity and to enable a proper analysis of all elements in the paintings. In the case of paintings which are interrelated, prevalent comparisons are drawn between such pairs, and discussed in detail.

The Philosopher's Lecture on the Orrery in which a Lamp is Put on the Place of the Sun

Fig. 8. *The Philosopher's Lecture on the Orrery in which a Lamp is Put on the Place of the Sun* (1766) by Joseph Wright of Derby.
Photo credit: Derby Museums Trust. Reproduced under the Creative Commons Attribution-NonCommercial-ShareAlike licence.

Joseph Wright of Derby's *The Philosopher's Lecture on the Orrery in which a Lamp is Put on the Place of the Sun*, also called simply *The Philosopher's Lecture on the Orrery*, or just *Orrery*, is one of the best known paintings of the Industrial Revolution, despite being painted towards the beginning of the Industrial Revolution, in 1766. The device which assumes the key role in the painting is an orrery which portrays the movements of the planets of the solar system around the sun, and constellations with the corresponding months are written on the rim of the orrery. The other key element in the painting is the philosopher who is conducting a lecture. Every other character in the

painting is visibly focused on either the orrery or the philosopher, mostly with an air of inquisitiveness, to the point of immersion. The lamp which acts as the sun in the experiment is not directly visible to the person viewing the painting, but directly illuminates the two children, a boy and a girl, sitting in front of the philosopher. The girl is pointing with her right index finger at an element of the orrery which she wants the boy, who we may presume to be her brother, to look at, and he follows her instruction. This acts as an indication of the fascination surrounding science, and in particular, simple curiosity surrounding fresh discoveries, as well as the will to share information so that others may learn as well. In a similar vein, the man on the left is making notes, with a content expression on his face, suggesting an academic fascination with the matter and the fulfilment of his expectations regarding the lecture. At the left edge of the painting, a woman is staring at the orrery in a weary, transfixed state. She appears at once both engulfed in the experiment and detached from it, and is seated farther away from the person nearest to her than anyone else, as all other characters are immediately next to someone else, whereas she sits by herself at the left edge of the orrery. Her demeanour can act as an example of people being surrounded by new discoveries but at the same time jaded due to not fully understanding them and trying to cope with the changes permutating society. It can also be an example of people feeling distanced from the general progress of technology, as they do not take part in its manifestations in their own life, and thus end up as idle observers of change. Her position as being seated separately from the rest can be a further notion of being somewhat distant from technological advances, but at the same time a careful observer. In the centre of the foreground of the painting, a young woman is leaning over the orrery, keenly investigating it. While the location of the lamp is obscured by this foreground character, Wright of Derby's detail of the shadows indicate its precise location, as the philosopher's shadow extends to his right side and the character in front whose figure hides the source of light is entirely dark to the viewer, sparing individual glints of light around her eye and her left side. The formation of shadows extends even to the metal strips of the orrery. At the right-hand edge of the painting, there are two men who are active participants of the lecture, as one of them is intently and contemplatively staring at the orrery and the other one is looking at the Philosopher, presumably having paid particular attention to his words. The Philosopher himself is somewhat discreetly pointing with his right hand to what is from the viewer's point of view the right edge of the orrery, although interestingly none of the observers of the lecture follow the trajectory of his finger. This is likely a result of the man on the left—the Philosopher's right—having asked a question and making notes as the Philosopher has provided an explanation, hence not of particular interest to the rest of the audience, though one of the men on the right looks at the lecturer and the girl in front of the philosopher glances in the general direction of the object the philosopher is pointing at. To the right of the philosopher, there is a shelf of books on the wall, further adding to

the general atmosphere of the acquisition of information and inquisitiveness. The general use of a single source of light casting shadows around the different characters and the orrery itself provides an eerie, in some ways mystical air to the scene. At the same time, it draws focus: there is an essential, unilateral centrepiece to the painting, and it is the orrery explaining science, directly illuminated by the only source of light in the scene.

Experiment on a Bird in the Air Pump

Fig. 9. *Experiment on a Bird in the Air Pump* (1768) by Joseph Wright of Derby. Photo credit: National Gallery. All rights reserved.

Joseph Wright of Derby's *Experiment on a Bird in the Air Pump* (1768) depicts a scientific demonstration where a cockatoo is placed in a bladder and air slowly withdrawn from the bladder, leaving the bird with less and less oxygen until it is completely deprived of air, demonstrating the effects of a vacuum. It has been argued that the experiment in the painting might be based on a demonstration conducted by James Ferguson. However, Ferguson's demonstration differs from the painting, as Ferguson stated that using an actual animal in such an experiment where all air is withdrawn and the animal is left to experience a slow death would be "too shocking to every spectator who has the least degree of humanity", and so he instead used a lungs-glass with a bladder to

demonstrate the same effect (Egerton, 1990, p. 19). It is likely that Wright of Derby regardless used the predicament of the cockatoo as a victim of scientific demonstration in his painting to add to the painting's dramatic nature. There are two sources of light in the painting: the moon casting its light through the window and the light behind the glass on the table below the bird. There is a skull in the glass otherwise filled with liquid, acting as vanitas, a reminder of the futility and insignificance of a human life. This is a reminder of the presence of death, which is also presented through the waning state of the bird. Due to the glass, the main light source is obscured and only known to the viewer through the light it projects and the shadows it creates. The general atmosphere among the characters in the painting is serious and even morbid. The candlelight setting of the scene further emphasises this, as the room is mostly dark, with the light mostly illuminating only the worried children and the bird, with the faces of the other characters being only slightly illuminated, with most of the room being so dark as to make it very difficult for the viewer to discern individual shapes beyond the characters themselves.

The spectators of the experiment are gathered around a table and vary from children to the elderly, each taking on different roles in relation with the bird that would seem to be on the brink of death as the nucleus of the experiment. The professor conducting the experiment is staring directly at the viewer, with his expression and the gesture of his right hand inviting the viewer to be inquisitive and interested. His left hand is above the bird's glass bladder, likely preparing to restore oxygen for the cockatoo before it is too late. To his right, there is a pair of lovers who have ceased to be interested in the experiment and are instead drawn to each other. The fact that they are positioned immediately to the lecturer's right would suggest, however, that they were originally keen observers of the experiment, or at least pretended to be so. Further to their right, at the left foreground of the painting, there are two more people, who are in contrast immersed in the experiment, observing the bird carefully. The line of their vision is not entirely clear, but it would seem that they are in fact looking at the boy by the window, suggesting that the birdcage is being properly opened and the bird is set to be released from the bladder. Of the pair of men, this is particularly prevalent from the man on the right, dressed in green. To the philosopher's left, there are a man and two young girls who are presumably his children. One of the girls has got up from her chair and cannot bear to watch what she perceives to be the untimely, forced death of the bird, and her father both comforts her in a bid to ease her mind and calmly explains the scientific reasoning behind the experiment along with its significance. The other girl is still seated and looks at the cockatoo with an expression of complete concern. The girls hold on to each other as they try to cope with the perceived tragedy. At the front right corner of the table, another man is seated, the most elderly of the spectators, leaning on a walking

stick, and is seen in a contemplative state, presumably having observed the experiment and now pondering its nature and possibly his own mortality. His gaze seems fixed on the skull in the jar, and so he can be presumed to be considering the vanity of life as an after-effect of the experiment, whereupon he has witnessed how simply the essence of life can be extracted. His age further supports this view. Beyond the table, in the far-right corner of the painting, a boy is standing by the window, holding a string which controls the door of the birdcage. The door is already mostly open, so it can be assumed that the bird is ready to be released from its troubled state as the nexus of the experiment and taken back to the safety of its cage, where it will be able to breathe freely.

The reactions of the spectators suggest that technology and science are largely an unfamiliar territory, but at the same time there is a general feeling of fascination towards new information. Despite the atmosphere of intrigue, the sinister, worried tone of the painting also suggests that science is not understood well and is seen as something which is still a largely unknown subject and thus an element resulting in worry, as it still represents a world of mystery. Additionally, scientific knowledge is known to some, but not others, causing a gulf between the two groups of people, whereupon the first group will try and explain its benefits to the other. The process of imparting knowledge can be seen in the painting as a metaphor for those who are well-acquainted with the new era ushered in by the Industrial Revolution trying to share their knowledge with those for whom it is strange and unfamiliar, thus helping them cope and become part of the new society of technological advancement. There is also the question of what science is actually used for: in the painting, the two girls are distraught by it and do not wish to bear witness to this type of experimentation where life and death are juggled. This also shows a darker side of science through its use as a measure which can be a catalyst for suffering and grief as a side effect of its main role as an instrument and cure for curiosity. In this scenario, perspectives on science are divided: on one hand, there are those with scholarly approaches, who would consider the value of the pursuit of knowledge to be beyond the suffering of an individual creature they consider expendable. On the other hand, there are those who dread the idea of causing suffering merely to discover or to demonstrate new advances in scientific knowledge.

While *The Philosopher's Lecture on the Orrery* and *The Experiment on the Bird in the Air Pump* are paintings which are thematically quite similar, there are some notable differences between them. The most important is the difference in atmosphere: in the latter, the mood is darker and the children in particular are concerned and even frightened for the bird which is in a state of peril. In *The Orrery*, however, the atmosphere is one of positive fascination, whereupon the children are intrigued by the orrery, and even immersed in the information it conveys. As stated earlier, there is no character in

The Orrery who is not immersed in the lecture either by staring at the model transfixedly or listening attentively to the philosopher. The orrery itself is a metaphor of illumination (Bamford & Wallis, 2017), and the corresponding reactions of the spectators are in essence indicative of how progress in science and awareness of new innovations are perceived within society. Expressions of carefree inquisitiveness as well as thorough contemplation in an effort to properly understand new information are good examples of this. Just as the orrery in the painting is the centre of attention, industrial progress had a ubiquitous role in urban societies.

The Blacksmith's Shop

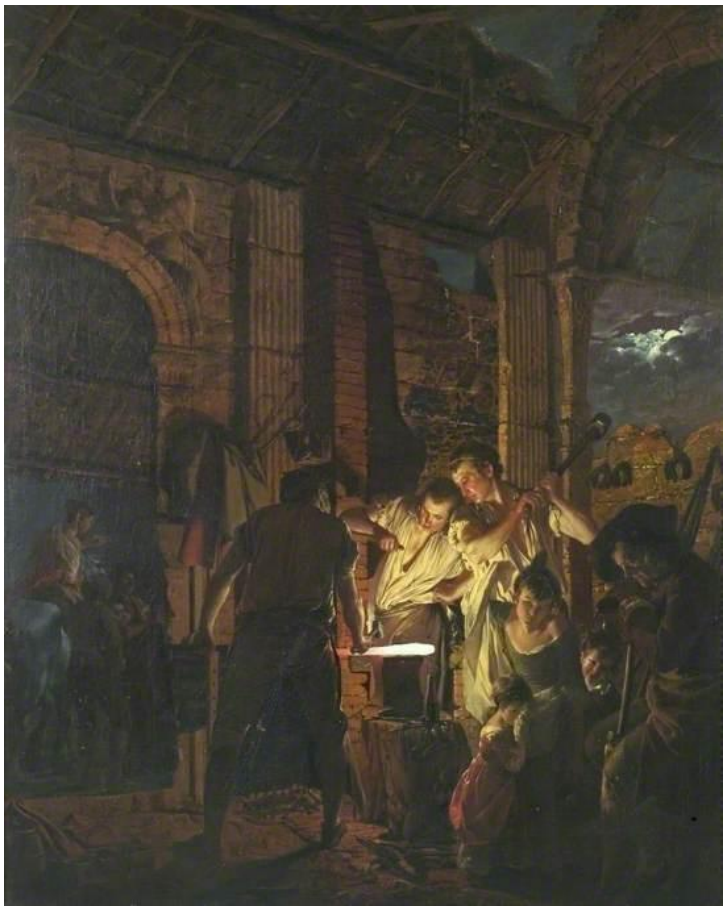

Fig. 10. *The Blacksmith's Shop* (1771) by Joseph Wright of Derby.
Photo credit: Derby Museums Trust. Reproduced under the Creative Commons Attribution-NonCommercial-ShareAlike licence. Resized.

The centrepiece of the scene is the work itself, done by three people in tandem. There is a marked contrast between the workers and the spectators in the scene; on the right side of the foreground of the painting, there is a child turning her face away from the heat, and two more people, presumably

her mother and brother, also looking away from the heat. They are joined by an old man who is sitting in the corner and leaning on a hammer as a weary and passive member of the scene. This could be a reference to traditional, more physical labour having been partly replaced through mechanisation, as well as new replacing old in the context of workers, not only in machinery. The presence of child spectators could be an example of the work being considered a fundamental aspect of society—they have been brought to the shop but have no part to play in the work itself. As they are joined by their mother, it can be assumed that their father is one of the workers taking part in the labour. The characters who are least visible are on the left-hand side of the painting and outside the shop, largely obscured in darkness. They seem to be part of the support mechanism of the main work. There is a man in front of this group of people, with his hand on an object and he may well be part of the manufacturing process, and simply taking a break from the work itself. Next to him, a woman is mounted on a horse, holding an item which seems to be directly linked to the labour, possibly a rod or a chain. The third person in the group seems to merely stand and chat. This group of three people is entirely detached from the ingot in the centre of the painting, and comprise a scene which is supplemental to the main scene of the painting. As is typical of Wright's paintings, there are only two sources of light: the iron ingot and the moon, of which only a third is visible, with the rest obscured by clouds. The ingot, and thus the work, is the epicentre of the painting and essentially acts as the only light in the scene itself, lighting the walls of the shop, as well as the workers and the family. The moon is in turn largely a backdrop. This can be interpreted as the ingot taking on a significance which has outgrown mere social activities. The manipulation of iron thus acts as an example of humankind asserting control over the elements and using available technology to create new objects; therefore, the industrial human has moved from being a user to being a creator. The work seems to be taking place in the remnants of a church. The church in question is likely a victim of the systematic iconoclasm initiated by King Henry VIII as part of the Reformation and fervently continued by his successor, Edward VI. The use of the ruins of a church as the setting for the painting speaks of the establishment of industry and technology as a new object of worship—technology is revered and adored as only deities would have been revered previously. A sacred place of worship has been reduced to being a mere worksite, which also speaks of how the importance of religion has diminished significantly. On the idea of treating technology as a god in the modern world, Postman (1996) writes that people believe in technology, "rely on it", "are bereft when denied access to it", are "in awe of it" even as they do not fully understand its workings, "condemn people who speak against it" and will alter their lifestyles, schedules and relationships to accommodate it, concluding that "if this be not a form of religious belief, what is?" (p. 38). These parallels between religion and industry help us understand the immediate impact of the Industrial Revolution, as industry effectively overtook

religion as the concept which guided people in their understanding of the realities of day to day life and provided them with a new source of enlightenment which would dictate their lives.

An Iron Forge

Fig. 11. *An Iron Forge* (1772) by Joseph Wright of Derby.
Photo credit: Tate. Reproduced under the Creative Commons Attribution-NonCommercial-NoDerivatives licence.

An Iron Forge is a painting which is very similar to *The Blacksmith's Shop*, and effectively a different version of it. As in *The Blacksmith's Shop*, there is a forge that is the centrepiece of the painting and projects a greater detail than the things surrounding it. Unlike *The Blacksmith's Shop*, however, there is no window and no moon in this painting, and so the forge is the only source of light. The machine

construct itself is immense and the dominant element of the scene despite doubling as a background for the characters in the painting. The location of the scene is sturdier as well: whereas *The Blacksmith's Shop* takes place in the dated, bare remnants of a church, *Iron Forge* is set in a building with reinforced brick walls and wooden beams supporting the mainframe of the ceiling immediately above the forge. The man in the centre appears to have a position of control and authority, and this is further punctuated by the cast of light upon him. His posture suggests a character of dominance, but his facial expression conveys weariness and a sense of sadness. Directly in front of him, another man is tasked with the handling of the iron ingot. Next to the man in the centre, a family, presumably his wife and daughters, are bundled together, keeping close to the forge. The child and the girl look fixedly in the same direction, but the viewer is left to merely guess what they are looking at. Behind the family, a dog is trying to stay away from the heat, which is another example of the machinery being portrayed as an element which stands above lifeforms and is even feared by them. On the left side of the painting, there is, as in the Blacksmith's Shop, a weary old man who projects a stooped demeanour. In both paintings, the old man in the corner also wears clothes with darker tones than the workers, and this further hides him in the darkness, with the workers standing out even more. The old man is joined by a young girl, possibly another child of the main smith; she leans on him and stares absently in the general direction of the viewer. There is also a basket on the ground near the old man's feet. It is not known what the basket contains, but the presence of the family might suggest that they might in fact have visited the forge to bring nourishment for the workers. This presumption would indicate that the old man is in fact taking a break and eating, as he watches how the work continues with only one of the three workers actively participating in the labour for the moment. He therefore assumes a similar role to the old man in *The Blacksmith's Shop*, as he is an aged person sitting in the perimeter of the scene, leaving the younger workers to attend to the work at hand and watching them at work.

The different aspects of iron striking, such as striking, heating and blowing are presented in the two paintings in great detail, and there is a notable difference in detail between the illuminated forge and the surrounding actors and objects, none of which are lighted in the same manner. The ingot in the middle of the painting is the only source of light, and illuminates the entire room. This conveys a sense of power for the ingot: not only is it at the centre of the painting and partly the reason each character is in its vicinity, but it has a direct effect on the outlook of the characters, illuminating them thoroughly and giving off heat in the process. The keynote of the painting would seem to be that even though the new machinery is immense and powerful, causing both wariness and weariness amongst those surrounding it, it is still the human who is in control and the key figure in the age of machinery,

not the machinery itself. Humans still exert control and reap the benefits, whereby the new machinery continues to function as a tool as more primitive machines have done previously.

The Alchymist, in Search of the Philosopher's Stone, discovers Phosphorus

Fig. 12. *The Alchymist* (1795) by Joseph Wright of Derby.
Photo credit: Derby Museums Trust. Reproduced under the Creative Commons Attribution-NonCommercial-ShareAlike licence.

The full title of the painting is *The Alchymist, in Search of the Philosopher's Stone, discovers Phosphorus, and prays for the successful conclusion of his operation, as was the custom of the ancient chymical astrologers*, and it is often shortened to simply *The Alchymist*. As with Wright of Derby's other industrial paintings, the machinery in the scene is very detailed. The status of science can be easily read from the expression of the alchemist: he is portrayed kneeling, in a stance which could convey a sense of spiritualism, and wears an expression of awe and concentration. Kneeling can also be an indication of subservience, which would in this case mean that the alchemist is dependent on his device, and thus also considers his technology a vessel of sanctimonious nature. This is also suggested by his sagacious pose, with his eyes barely above his device, measuring it intently, and his arms spread out in opposite directions, almost in a way that might indicate that he is trying to balance himself, but in fact their position further conveys an aura of spirituality along with the stillness of time. It can be presumed from the title of the painting that the purpose of the device in question is to create the philosopher's stone, a stone which could turn common metals to gold as well as create the elixir of life, which would extend the life of its drinker. The stone would therefore bring its creator both prosperity and immortality. Other purposes of alchemy included transforming base metals into noble metals, for example turning mercury into silver (Newman & Grafton, 2001, p. 19). By the time Wright composed the painting, in the 1790s, alchemy was already in disrepute and no longer considered a valid branch of science (Principe & Newman, 2001, p. 386). In the painting, the alchemist is trying to discover and create the philosopher's stone and ends up discovering phosphorus instead. The alchemist's cautious, sagacious stance reflects the volatile nature of the work he is carrying out, as well as his spiritual relationship with his work. Lighting is once again minimal, with the glow of the alchemist's device projecting most of the lighting, and a candle on the table between the two other figures along with the full moon providing additional light. This set-up allows the device and the alchemist to be entirely visible, whereas the other parts of the room are dark and unclear. This also adds substantial emphasis to the device and its role in the painting: when a viewer sees their first glance of the painting, their attention is immediately drawn to the device and the alchemist, and only then to everything else. The other characters, who might be presumed to be apprentices, are slightly outside the breadth of the alchemist's workspace and observe the alchemist without interfering in his work, apparently nevertheless keeping a watchful eye on him in case they might find something new to learn or summoned to help with the proceedings of the experiment. The painting can be related to the Industrial Revolution by considering the alchemist's reaction to his work: he exudes an air of astonishment and complete concentration in his work with the modern device. This acts as an example of technology bringing a new era of illumination and discovery to the lives of humans, causing them to behold and bewilder the new advances. Similarly, there is a spiritual side to how mechanisation is

approached: the fruits of labour which are sought and likely amended through the use of new technology are revered, and so technology as their pre-requisite is also treated with gratitude and respect.

The Fighting Temeraire

Fig. 13. *The Fighting Temeraire* (1839) by J.M.W. Turner. Photo credit: National Gallery. All rights reserved.

Turner's *Fighting Temeraire* (1839) depicts a warship which had an important role in the Battle of Trafalgar in 1805 as it is towed away by a steam-powered tug to be dismantled at the end of its service life. In the Battle of Trafalgar, the 98-gun Temeraire saved Lord Nelson's flagship HMS Victory and captured two French vessels, remaining in service until 1838, at which point it was decommissioned and sent to be broken up (National Gallery). The Temeraire is seen as a reminder of past glory in both naval combat and shipbuilding, and is tugged away by what can be seen as its replacement as the new apex of engineering: a steam vessel which projects a different sense of power and does not depend on the speed of wind, but can in turn be used for tasks which have required far larger vessels in the past. As such, the painting acts as a metaphor for the death of the age of sail. The contrast in the sizes of the Temeraire and the steam vessel is notable, as is the steam rising from the tug partly obscuring the Temeraire, as the rise of the age of steam has largely obscured and overthrown prior, familiar

technologies. The setting sun on the right side of the background adds a melancholic, solemn tone to the final journey of the ship of war.

Rain, Steam and Speed

Fig. 14. *Rain, Steam and Speed* (1844) by J.M.W. Turner. Photo credit: National Gallery. All rights reserved.

J.M.W. Turner's *Rain, Steam and Speed* (1844) portrays a moving train against a background which is partly blurred due to the speed of the train having an effect on the vision of a person seeing it, and this effect is a key element in Turner's painting. Elements of the landscape, such as the sky, the city, the bridge near the left edge of the painting and water are largely distinguished from one another by their outlines, with their characteristics jumbled together as a description of the perception of velocity. Turner based the effect on a personal experience where he stuck his head out of a window of a train to observe the effect of the speed of the train and the pouring rain (Butlin & Joll, 1977, p. 232). The bridge in question is at Maidenhead and was constructed by Isambard Kingdom Brunel for the Great Western Railway (Weelen, 1981, p. 143). There is also a hare running in front of the train, acting as a metaphor for something which was previously seen as an apex of speed in conversational use being overtaken by a modern innovation which has become the new apex. Like the hare, which was formerly seen an example of great speed, is overtaken by the steam-engine train, so have familiar, less efficient methods of manufacture been replaced by new industry. In the context of the Industrial Revolution, the painting portrays the new era as one of significant progress in the world of technology and

industry, with advancements considered something which acts as a leap forward for society. The steam train is also a symbol of a turning point in mechanisation, as it was considered by some as the peak of innovation during the Industrial Revolution, as mentioned in section 3.1 of this thesis. Like the steadily advancing steam-train, industry has a route upon which it is set, and will overtake everything else on its course to its destination, never yielding or retracting until it has done so. There is, in essence, no way to slow down the endless, engrossing locomotive breath of industrial progress.

Work

Fig. 15. *Work* (1865) by Ford Madox Brown. Photo credit: Manchester Art Gallery. Reproduced under Creative Commons Attribution-NonCommercial-NoDerivatives licence.

Of the paintings under analysis, Ford Madox Brown's *Work*, of which there are two versions, one positioned in Manchester Art Gallery and the other in Birmingham Art Gallery, is the most recently painted one, as it was finished in 1863. Therefore, the painting portrays the state of the Industrial Revolution at what might be considered its sustained peak, and should certainly be representative of the point in time where all the effects of the Industrial Revolution were present in society and the changes caused by the Industrial Revolution had settled and were no longer seen as a change in

process, but rather a change which had become a permanent fixture of life. The version discussed here (Fig. 7) is the one on display in Manchester Art Gallery. Of the two versions, this one was started first, and is thus the original version. The only notable difference between the two versions is the face of the woman carrying a blue parasol walking at the left edge of the painting, as the versions present a different person: in the Manchester version, the woman's face is that of Ford Madox Brown's wife (Hueffer, 1896, p. 196); in the Birmingham version, it is the face of the wife of the commissioner of the painting (Pre-Raphaelite Online Resource). The scene of the painting portrays navvies, or navigational workers, toiling on the street as other figures lead varying lives around them. The key aspect of the piece is the contrast of sturdy workers in the middle with people who do not work around them, ranging from passers-by at the left edge and in the background of the painting to people on the right watching the navvies. Other characters in the scene include sleepers in the ditch, marketers at the right edge of the painting and lobbyists marching. The contrast between grit and brick houses is also notable, and acts as a marker of the difference in status between the workers and their surroundings. The workers are ultimately a mere backdrop or a stationary obstacle for everyone else in the scene despite the fact that they occupy the centre of the piece. The literal centrepiece of the painting, therefore, is a mere backdrop in the scene itself. The pair of men leaning on the fence to the right of the navvies are presumably the managers who have commissioned the construction, and are observing the navvies in a watchful manner, though themselves clearly away from the grit of the labour, projecting an air of superiority. They are described as 'brainworkers' in Madox Brown's (1865) exhibition description of the painting, meaning that like navvies, they are workers, but their task is entirely different, as instead of working with their hands, they work with their minds (p. 2) by planning the work that is to be done by the navvies and then overseeing it whilst considering how their plans could be improved. They are represented as sitters by Thomas Carlyle and Frederick Denison Maurice (Hueffer, 1896, p. 195). They are in turn contrasted with people in the ditch, who are apparently out of work and have hence had to resort to sleeping in the ditch due to their economic difficulties. They would presumably be undertaking the navvies' labour if there were a need for more workers. However, because of the economic situation, they are unable to find work, and are left to merely watch as the navvies nearby, themselves having to cope with spare earnings from sturdy labour, proceed with their work. Their depression can also act as a metaphor for that of society—there is not enough work available for everyone to earn money, and so those who are left on the outside have little else in their lives but to try to make ends meet somehow and hope for an opportunity to present itself at some point so that they may resume a life where they can work, earn money and live without having to ceaselessly worry about their predicament. Additionally, they are literally down in the ditch, whereas the brainworkers are standing upright, leaning back on the fence and so do not

even have to support themselves. At the right edge of the painting, there are lobbyists marching down the road, holding signs encouraging people to vote for a specific candidate. It might be thought that these lobbyists are linked to the sleepers in the ditch in that they have seen the state of depression society has entered and want to change the status quo. They would thus try to improve the standings of the unemployed as well, and make such changes to society that they might be able to escape the perpetual gloom of the ditch and find work, thus enabling themselves to lead the kind of life they would consider right for themselves. However, Madox Brown explains their motives in the Exhibition catalogue (1865): they are mere idlers who have been tasked by the sausage maker Bobus to carry signs urging people to vote for Bobus. It might therefore be concluded that instead of being agents of change, they are merely another example of the widespread idleness in society, as another symptom of industrial disease. At the immediate foreground of the painting, in front of the navvies from the viewer's perspective, a group of ragged children are idling in the street. The eldest of the four children has assumed the role of a caretaker, and is looking after the others, holding the youngest child in her left arm and tugging the hair of her eldest brother, who looks at her in a mischievous manner, having stepped away from his siblings to fiddle with the navvies' wheelbarrow. The child to the girl's left is oblivious to the disciplining going on in their immediate vicinity, and instead surveys the navvies at work. In Madox Brown's exhibition catalogue description, the mother of the children is said to be dead and their father an alcoholic who is entirely negligent and will likely be prosecuted by law on account of his negligence (p. 3). Behind the navvies, there are an upper-class man and woman approaching them in the distance on horseback. In this case, the man, portrayed as a sitter by the artist Martineau (Hueffer, 1896, p. 196), is presented as young, prosperous and "true-hearted", but as his daughter notices the block ahead, she tells him that they must take a different route, and thus they will not come in contact with the navvies (Madox Brown, 1865, p. 4). Unlike the people passing the navvies from their left, the horseback pair are separated from the work by the barrier and so will remain untouched by the grit.

Wright (2017) writes that while divisions between different classes and otherwise separated groups of people are a key aspect of the painting, *Work* is also structured around grouping people of similar standings and agendas together, with the navvies, the motherless children, the migrant workers, the sign-carriers and the two pairs of upper class passers-by each having their own position in which they have settled and they are thus separated from the other groups of people with which they would not identify (p. 432) even as they share a relatively small area in the city. As the different characters are scattered all around the painting, with some groups in close proximity to others, whereas other groups stand clearly separate from everyone else, the effect in question also divides the attention of the

viewer, and selecting areas or details in the painting for further scrutiny is left to the viewer (Wright, 2017, pp. 434–435).

The upper classes seem to enjoy a status of not needing to commit to tough physical labour and they can reap the benefits of a less hardened lifestyle. Out of all the different groups of characters, they are the ones who are most comfortable with the way things are, and the work being done is just a fixture in the landscape for them, though it may also function as an obstacle which can slow down transportation for them. The upper classes in the painting are either entirely upright or mounted on a horse, and thus quite literally above the workers and the sleepers. This acts as an extended metaphor for their position above everyone else in society. Two upper class women are passing the navvies in the painting, described by Madox Brown (1865) as "the rich who have no need to work" (p. 2), and one of them is looking straight ahead, away from the workers, despite having her movement automatically restricted by the ongoing work. She is also holding her dress above the ground to keep it from touching the grit, and so is making an effort to ignore the process of labour as well as she can. Her bright red dress is also a stark contrast to the sandy surroundings, although darker shades of red are present in several elements of the painting. Prosperous people thus turn a blind eye to the grit of the lower classes at the same time as they take advantage of their labour, which can also act as a metaphor for fruits of the labour of lower classes being abused by the rich and the advantageous.

The paintings under analysis differ considerably in their subject matter and the views presented therein: Madox Brown's *Work* is a clear commentary on social values of late-era Industrial society, in particular differences between different classes, especially as they pertain to attitudes towards other classes and to perspectives on work. Both of Turner's works analysed highlight a new era taking over from past times, ushered in by means of modernisation of machinery. Wright of Derby's works, in turn, sit somewhere between the other two approaches, as technology is a key element in the paintings, but is largely a tool for enhancing labour and not a source of upheaval, and at the same time acts as a target of fascination for people. While Madox Brown does not portray new machinery of the Industrial Revolution at all, focusing instead on people, and Turner's sole focus is the modernisation of machinery, without a single human in sight, Wright of Derby has elements of each, but to a far lesser degree. It has to be noted that Wright of Derby was the earliest of these painters, and his works were painted at a time when the Industrial Revolution was still in its infancy, and so he could not rely on the results of the Industrial Revolution as inspiration as the others could. Madox Brown's approach is certainly the most polemic of the three painters, and similarly dependent on the time of painting—the impact of the Industrial Revolution on different classes is a key element in *Work*. Essentially, the

three painters portray three different stages of the Industrial Revolution: Wright of Derby portrays the infancy, where minor technological advancements are looked at through eyes brimmed with childlike curiosity, without much of an effect on society as a whole. Turner portrays the Industrial Revolution at what might be considered its peak, as the use of steam changes the landscape of Britain irrevocably and permanently, including the introduction of railways. Madox Brown was able to witness the entire array of dire consequences suffered by working society as a result of the Industrial Revolution, and so he portrays both the discrepancy between social classes and the desperation of people left to merely hope that there are better times ahead. Technological advancements of the Industrial Revolution are not even considered, and the era his painting portrays is largely the manifestation of the consequences of the Industrial Revolution, which have effectively become a permanent fixture in British society.

6 Discussion on the significance of the findings

The analysis undertaken in this paper focused on the works of three painters, and it might be argued that the findings would have been more complete and more representative of the Industrial Revolution if there had been more variance in the choice of painters. Similarly, analysing such closely related paintings as *An Iron Forge* and *The Blacksmith's Shop* might be considered superfluous and thus unnecessary in the formation of an overall perspective of the society of the Industrial Revolution. Alternatively, it might be argued that due to the existence of these interrelated paintings, they should be compared thoroughly as their differences could in fact prove to be very relevant for the purposes of the study, and direct comparisons would also help highlight key aspects related to the subject matter. As tends to be the case with studies related to the arts, further studies could use the findings in the paper at hand as a base and broaden the scope of research, thus adding additional layers of understanding to the study. It could also be worthwhile to conduct a study with consideration for paintings as one element of research, and literature discussing the same subject matter in similarly polemic and direct fashion as another element, thus comparing the two approaches to presenting historical perspectives.

Through the analysis of these paintings of the Industrial Revolution, there are several notions which are indicative of the status of the Industrial Revolution among society of the era. Most notably, the advancements of technology are seen through curious eyes and act as a source of illumination. Technology is ushering in a new era, acting as the new which replaces the old, and the earlier stages of the Industrial Revolution are a phase of transition where steam and steel take over as the frontrunners of progress from previous technologies. Railways act as a catalyst for further developments leading to a complete transformation of long-distance transportation. What was formerly seen as fast, becomes slow, and what was formerly considered an unrealistic expectation, has become reality. Thus, the age of steam takes over from the age of sail in transportation. Symbols of past glory are seen as mere relics of a former era and put out to pasture so that the old guard can be replaced by a new, entirely different generation. Technology becomes a beacon which society must follow, and presents a catalogue of new experiences which the people following it will discover by degrees. They will also adapt to these changes and restructure their understanding of the world accordingly. The Industrial Revolution effectively transformed the lives of people permanently, and the changes it caused became a fresh reality for them. Industry became a facet of life for everyone, not simply a consideration for people actively working in factories.

While the changes realised through the Industrial Revolution caused a transformation in the realm of commerce, the effects on the daily life of people are evident as well. The different stages of the Industrial Revolution initiated different reactions to it. At first sight, the changes brought forth by the Industrial Revolution are seen through gleamy eyes of curiosity which are urgent to fathom these new advancements and intent on looking forward to what the next advancement will be. Common people might think that they are about to see a new world which is wholly different from that which they are accustomed to. Looking forward to this brave new world of new technologies and miracles seems to be automatic and fully sensible, a logical reaction to the changes surrounding these individuals living a life where any moment can generate something which would previously have been outside the realm of reality. However, as the degree of change starts to become normalised in the minds of people, they also discover the less positive after-effects of industrialisation which have not been noticed before and which progressively become more and more apparent—the world as they know it is changing and they start to become alert to these changes, and aware of their accumulative nature and their effects on the people who have been tasked with facilitating their appraisal and adaptation. For instance, the people working to put these changes into action are in dire straits, as they have to work in dreary conditions, expending all they can and receiving very little compensation for it. Those who commission this work, their supervisors, can simply watch their workers toil and sweat, for the means of commerce mean that they have complete control over their subjects and will use their reins in whichever way they find will be most profitable. Workers suffer under the pressure of the sole which has no eyes, but nevertheless carry on, as they know the work has to be done and they believe there is no viable alternative for them. They possess no means to resist the progression of industrialisation or to hinder its effects on their livelihood. In the end, relentless toil and food on the table is preferred to a life of sleeping on the street without being able to provide for one's family. Elsewhere, they are contrasted by those who have no need to toil in such a manner, but who instead work with their brains or not at all, most probably due to their background, and thus the state of their reality is due to good fortune which functions entirely independently from the will or actions of either type of these privileged individuals or the toiling worker. The social consequences of the Industrial Revolution separate people into different groups beyond the systems of labour as well: some people consider scientific advancement to be an intrinsic value, and an element of life which everyone should revere, respect and learn from. Others, in turn, are wary of the effects of these advancements, and would prefer to tread with care. They want to know the uses and implications of the advancements before applying them. They also believe that as a process, advancements for the sake of advancements would not be beneficial or benign—they find the extrinsic uses of science to be the only uses worth consideration, and do not trust the people who think in intrinsic terms to be able to make the right

choices for them. People are, therefore, divided into these two groups by their approaches to industrial progress. On one hand, there are the inventors, the thinkers and the optimists who find that industrialisation brings necessary advancements to their way of life and there is in fact no matter of choice involved—they find that industrialisation is elementary, and the choices involved only include the questions of how, where and when the new advancements are applied. On the other hand, there is the group of conservationists, machine wreckers and pessimists, who consider rapid industrialisation a danger to life as they know it. Some of them find that industrialisation is useful and even necessary, but even they are frightened by its rapid degree of progression, and also find themselves helpless to hinder it. They are stuck with the reality of having to adapt to the changes taking place in society, even if they disagree with the changes in question. They find that the process of industrialisation should be controlled and monitored carefully so that humans can take full advantage of it instead of being reduced to faceless masses of factory hands. In the end, the contrast between the two groups is a matter of perspective, of whether industrialisation is valued intrinsically or extrinsically. Despite their differences, the two groups will continue to exist side by side and create a new society which not only uses technology in their daily life, but is irrevocably shaped by it, and which will therefore have a perspective of life which will be fundamentally different from its predecessors.

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